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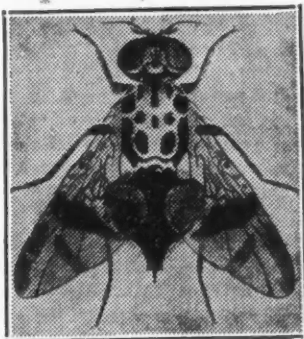
Mediterranean Fruit Fly

By J. R. Watson, Entomologist, Florida Experiment Station

The discovery in Florida of the Mediterranean fruit fly, undoubtedly the most dangerous fruit insect in tropical and subtropical climates, has naturally aroused in the minds of the growers much interest in this insect. The following notes are given to acquaint the growers with the appearance of the insect, character of its injury, and the main points in its life history.

The adult is a fly considerably smaller than the common house fly, about the size of the horn fly so common about cattle. The abdomen of the insect, particularly of the female, is very broad, almost roundish in appearance but the end is abruptly constricted into a very conspicuous point, the egg laying apparatus. The insect is a very pretty object as viewed under a lens, the thorax being marked conspicuously with glistening white areas which shine like burnished silver in the sun. The wings are conspicuously marked with diagonal brown bands or less fringed with black lines. The veins of the wings are also jet black.

When on the fruits the females hold their wings in a very characteristic manner. They are allowed to droop down until their tips rest on the surface of the fruit. No common fly in citrus groves carries its wings in this manner. The flies are rather sluggish, particularly when laying eggs on a fruit but when alarmed can dart away at good speed. They are inactive on cold mornings. On the unusually cold morning of April 17th they did not appear in numbers



until about 11 o'clock. The adult insect feeds upon the fruit juices, such juice as may exude from an injury to the fruit, also it feeds upon honeydew exuded by such insects as aphids, whiteflies and some scale insects. Unless than can obtain food within three or four days after they emerge from the pupae, it is said that they will die, but adult females which have been regularly fed have been known to live nearly a year. After the female has fed from four to ten days, she is ready to lay eggs, if she can find a suitable fruit upon which to lay them; but it has been observed that females which were not able to obtain access to suitable fruits upon which to lay their eggs have refrained from laying eggs for six months; after which, when presented with proper host plants, they laid eggs as actively as younger females. The eggs are laid just below the surface

of the fruit—just inside—through a hole made by the ovipositor of the female. This puncture is very small, about the size of a pin prick and very hard to detect. In this puncture the female lays from one to six eggs, but it is very common for many females to use the same egg puncture, so there may be many times this number of eggs in a puncture. The eggs are about 1-27 of an inch in length and very much longer than broad. They hatch from two to four days into minute larvae. These whitish grubs are almost exactly the color of the cells of the grapefruit. They are therefore hard to detect. After they begin feeding on the fruit, the pulp decays and a soft spot forms under the skin. This is usually the first external sign of infested fruit. This spot has a somewhat paler, more watery appearance than the rest of the rind and, when the finger or thumb is rubbed over it, it yields to pressure, although there may be no hole visible at this stage, only an extremely small puncture through which the eggs are laid. These soft spots are nearly always on the lower side of the fruit as it hangs on the tree. This characteristic will enable one to distinguish the work of the Mediterranean fruit fly from the common pumace fly which lays its eggs in rotting fruit. Pumace flies must have a good sized opening through which to lay their eggs in the rotting pulp, an opening easily seen by the naked eye.

As the larvae increase in size, the

Continued on page 21

Mediterranean Fruit Fly Quarantine Effective May 1, 1929

Digest and Interpretation by W. M. Scott

Under date of April 26th, Arthur H. Hyde, Secretary of Agriculture quarantined the State of Florida to prevent the spread of the Mediterranean Fruit Fly in the United States and promulgated rules and regulations governing the shipment of fruits and vegetables from the quarantined State in interstate commerce.

Fruits and Vegetables Affected

This quarantine relate to and affects all host fruits and vegetables, that is, fruits and vegetables in which the Mediterranean Fruit Fly can live and multiply; namely, peppers, egg plant, squash, pumpkins, gourds, beans, ripe tomatoes and all fruits except pineapples.

Coconuts and other nuts, watermelons, potatoes, green tomatoes and all vegetables except the host vegetables named above are exempt.

Infested Zones—(Zone 1)

Each infested property and the area within one mile of this infested property shall constitute an infested zone.

All host fruits and vegetables within this zone must be destroyed or processed or treated in a manner satisfactory to the Inspector of the United States Department of Agriculture as soon as possible after the discovery of the infestation. No host fruits or vegetables shall thereafter be permitted to develop to susceptible stages of maturity or to remain within such Zone, nor shall any host vegetables be planted in such Zone until the State Plant Board shall determine that all infestation in such Zone has been eliminated and these restrictions shall be removed.

Satisfactory treatment must be applied to the soil of premises in the infested Zone and to production and packing equipment, containers, railway cars, boats and other vehicles and all other articles which have been associated with the production and handling of such fruits and vegetables.

Host fruits and vegetables produced outside of the infested Zone cannot be packed for shipment in a packing house located within this

Zone.

Protective Zone (Zone 2)

The area included within nine miles of any infested zone shall be designated as a protective zone. Host fruits and vegetables produced within this zone may be shipped under permit until June 1st this year and from about November 1st to May 1st thereafter.

Prior to June 1st this year (May 1st thereafter) all ripe or ripening citrus fruits produced within this zone must be removed from the trees for shipment, destruction or processing. The period from that time until the following shipping season is known as the host-free period.

During the host-free period, no host fruits or vegetables of any kind shall be permitted to grow or exist within the protective zone except green (immature) citrus fruits and fruits and vegetables in storage and on retail sale for immediate consumption.

"Permits may be issued for the interstate movement of CITRUS FRUITS from a PROTECTIVE ZONE only to the District of Columbia, including Potomac Yards in Virginia, and to destinations in the States of Maryland and Pennsylvania and States north and east thereof, including shipments via any of such States to foreign countries. Such shipments shall not be subject to diversion enroute except to destinations within the territory indicated."

Any packing house located outside of the protective zone handling fruit produced within a protective zone is subject to the destination restrictions quoted above as to all fruit handled in the house from whatever source.

The movement of host fruits and vegetables in bulk, from protective zones, is prohibited. They must be packed in standard containers and shipped under permit, and in the manner provided for fruits in paragraph three below.

Territory Outside of the Protective Zones (Zone 3)

1. Fruit may be shipped only under permit to be issued by the In-

spector of the United States Department of Agriculture, such permit to be attached to waybill.

2. No bulk shipments of citrus or non-citrus host fruits permitted.

3. Fruit must be packed in "standard commercial boxes" and shipped in carlots in refrigerated or ventilated cars or boats equipped for refrigeration, such cars or boats to be iced or screened, except that express shipments may be made provided the express cars are kept closed and screened while passing through or remaining in any protective or infested zones. Express shipments to be in standard containers, each of which must have attached thereto a permit tag.

4. The issuance of permits will be conditioned on district or grove inspections and packing house control.

5. "Packers, shippers, or others intending to move or allow to be moved citrus fruits shall make application for a permit to the office of the Plant Quarantine and Control Administration, Orlando, Florida, as far as possible in advance of the probable date of shipment. Applications shall show the nature and quantity of the fruit it is proposed to move, together with the location at which it is being or will be packed, the name and address of the consignor and a list of all premises from which fruit for packing will be secured, together with their locations and the names and addresses of the owners.

"Each applicant for a permit shall file with his application a signed statement in which he agrees: to notify the inspector of all additional premises from which fruit for packing will be secured; to maintain, available for examination by the inspector, a complete list of all consignees, together with the amount and date of each shipment; not to use nor permit the use of his permit tags on citrus fruits from any premises until he has been issued a notice in writing by the inspector that shipment of fruit from such premises is approved; to discontinue packing and on notification by the inspector either

Continued on page 28

Fertilization of the Valencia Orange

(Paper Read by H. Guy Nickerson before the Annual Meeting of the Florida Horticultural Society at Clearwater, Florida, Wednesday, April 10, 1929)

It is with some hesitation that I appear before this body of horticulturists, most of whom outrank me in years of experience, to discuss a subject with as many ramifications as has the subject assigned to me, namely, Fertilization of the Valencia Orange.

Time will not admit of a detailed discussion of every phase of this subject; so I will omit any but a passing reference to the handling of the young tree and pass along to the fertilization of the Valencia budded to sour or grapefruit root.

You will pardon me if I seem to limit this talk to my experience in the handling of this variety on the high, pine lands of Polk County, where I have had a varied experience in the production of Valencias on lemon root, on sour root and upon grapefruit root.

Much has been said of the undesirability of both sour and grapefruit stock in the Sand Hill Country. I am unable to subscribe to this viewpoint in the handling of the Valencia orange. Both stocks have been found to do well, if given the cultural care and fertilizer they require from the day they are set in the ground.

The holes where trees on such stock are to be planted should be thoroughly composted weeks in advance and, once a good start is made by the young tree, frequent and generous applications of a balanced fertilizer, running heavy to ammonia, should be made for the first few years, increasing the phosphoric acid and potash content as the trees reach bearing size.

The feeding roots of both sour orange and grapefruit stock are somewhat coarse and not at all aggressive in reaching out for plant food. For this reason, unless a close watch is kept of the trees, their growth will slow up and the tree harden to a point where it is almost impossible to re-establish a vigorous growing condition.

When a tree is brought to a fair bearing size, one must see to it that the ammonia content is kept well up and derived from organic sources mainly. A potash content exceeding eight per cent should be avoided, excepting under extreme conditions.

May I remind you again, this discussion so far has to do only with the fertilization of Valencias on sour root and grapefruit root in Norfolk sand.

During the past year, I have had occasion to visit the Valencia districts in many parts of the state. Irrigation is coming to be accepted as a necessity; and irrigation once installed and used regularly, will force a decided change in our fertilizing formulas and in the quantity of fertilizer to be applied per tree. For instance: a Valencia tree which will require twenty pounds of a balanced ration per application, can well get along with fifteen pounds, if irrigation is practiced. I have installed a pressure system in one grove during the past year. I am convinced that this installation will cut my fertilizer bill sufficiently each year to offset the added cost of irrigation. I am convinced also that a lot of fertilizing theories which I have practiced for the past twenty years must be eliminated. In fact, irrigation is forcing me to begin again at the bottom and completely revamp my fertilizing practices on all varieties of citrus, and on the Valencia orange in particular.

If one has any doubt as to the far reaching effect irrigation is having on the Valencia orange, where proper provision has not been made by reducing the ammonia content, raising the percent of potash and reducing the total poundage, let him visit any packing house where irrigated Valencias are being prepared for the market. Note the heavy percentage of large sizes, coarse texture and general appearance as to color and weight of the fruit.

I have refrained so far from any reference to the fertilization of the Valencia on lemon root.

The aggressive feeding habit of this stock makes such important factors as size and texture of the fruit very difficult to control. On high pine land, regular cover cropping of the young grove is most advisable in order that a proper soil body may be developed by the time the Valencia tree reaches a good bearing age. Without proper soil texture, the quality of one's fruit will rise or fall in

direct contrast to the abundance or scarcity of autumn and winter rains.

Valencia blocks on lemon root, well fruited, must be generously fed in the late fall if their vitality is to be maintained at a level which will enable the tree to carry the mature crop through the winter, and set and hold a satisfactory bloom the following spring. A 3-8-8, or a 3-8-10 analysis, with at least two-thirds the ammonia derived from organic sources, has proven to be a very satisfactory fall application.

If winter irrigation is practiced, not less than ten per cent potash is essential; and under heavier soil conditions, two per cent ammonia may be all that is required.

One's failure to properly measure a Valencia tree's requirements at this particular time of the year, is likely to prove disastrous to the crop of mature fruit which up to this time may have developed most satisfactorily as to size, texture and weight.

The spring fertilizer application is likewise important. Here again, too heavy a hand can work serious damage to the crop of mature fruit which the owner, by reason of market conditions, may desire to hold on the trees until late in the Valencia season. A 4-8-8 analysis, with about half the ammonia derived from organic sources, has been found desirable on non-irrigated blocks. Where irrigation is practiced, this same formula with fully two-thirds the ammonia derived from organic sources, should prove sufficiently stimulating. And by elimination of all culture in the irrigated blocks, mature fruit should suffer only to a minimum extent, as to its color and quality.

The elimination of the summer application to Valencias will be found most helpful in holding down the size of the young fruit and improving the texture. If some feeding is found necessary, it should be done most sparingly, with a carefully balanced ration of high potash and low ammonia, and culture either entirely eliminated or reduced to a minimum.

I must confess that my efforts to obtain Valencia quality and full juice content on lemon root in the past

Continued on page 30

Mediterranean Fruit Fly

Fighting The Fruit Fly

By P. L. Waycoup

This writing is precisely a month after the accidental discovery of the Mediterranean Fly in Florida on April 6. What a month! A month of alarms and excitement, of feverish activity, and, upon the part of some, of tremendous exertion. Only approximately three weeks since the State Plant Board focused all its activities upon this newest, and said to be most dangerous pest; but in that three weeks almost a miracle of organization has been perfected, large areas have been placed under positive quarantine, hundreds of infestations have been definitely located and posted, hundreds of thousands of boxes of fruit have been destroyed under supervision of State Plant Board inspectors, and large acreages have been sprayed with poison bait to attract and destroy the fly.

Well meaning friends of J. C. Goodwin, chief of the nursery inspection service of the State Plant Board, certainly started something when following adjournment of a meeting of nursery inspectors in Orlando in the first week in April they placed some grapefruit in his car to be "taken home to the family." It was in Mr. Goodwin's home in Gainesville that the original discovery was made. Verification was made at the Gainesville laboratories; but to avoid any possibility of a false alarm Dr. J. H. Montgomery, chief of the Board's quarantine service, boarded one of the first trains for Washington carrying specimen larvae, there to obtain the corroboration of the experts of the United States Department of Agriculture.

From then on things began to happen, and since then have been happening fast. Hasty scouting for the fly by State Plant Board men revealed a number of heavy infestations in and about Orlando and Winter Park. Reaching out a bit, infestations were found in the Conway Section southward from Orlando, and northward up through Maitland into Altamonte Springs. On April 15 a quarantine was proclaimed, and units of the Florida National Guard under command of Major Preston Ayers were ordered out to patrol lines of communication to prevent the movement of fruit from inside the quarantine area to territory outside.

County commissioners of Orange County tendered the State Plant Board use of the old Orange County courthouse in Orlando as headquar-

ters for Mediterranean fly activities. The force in this field was placed under command of A. C. Brown who began simultaneously the work of building an organization of suitable size and of carrying on actively the fight against the fly in that area. Early discovery of additional infestations within this same area pointed to the real gravity of the situation; and Dr. Wilmon Newell, plant commissioner and chief executive officer of the State Plant Board, abandoned his usual headquarters at the College of Agriculture and came also to Orlando, there taking active charge in the face of what had been ascertained to be a most serious situation.

Government to Aid

In Washington on April 22 the Federal Horticultural Board met to consider the emergency. The result was a modified quarantine of Florida, terms and regulations therefor being promulgated on April 25 from the office of C. L. Marlatt, chief of the quarantine service of that board. Secretary Hyde approved the terms of the quarantine as of April 25, and effective May 1. Among Florida growers and shippers in Washington to plead Florida's cause were Messrs. Joshua C. Chase, W. M. Scott, C. C. Commander and John A. Snively. They were aided by the Florida delegation in congress, particular credit being due to Senator Fletcher, Mrs. Ruth Bryan Owen, and Hon. H. J. Drane for the success of Florida's efforts. Through the instrumentality of Dr. Marlatt, Secretary Hyde and Director of the Budget Lord, the Congress has approved the transfer from pink boll worm extermination work of an unexpended balance of \$4,250,000, which sum already has been made available for the fight against the Mediterranean fly. Exhibiting its confidence in Dr. Wilmon Newell, the United States Department of Agriculture has placed the field work in Florida against the fly under his direction; and has sent to Orlando H. T. Cronin to handle the financial administration of the government funds. Liberal state appropriations apparently are assured before the adjournment of the Florida legislature; and finances for the early part of the battle thus are assured.

Counties are Helpful

County Commissioners of Volusia County are reported to have appro-

priated ten thousand dollars to be spent under the eye of the commissioners by the county agent to speed up the early work in that section. In Seminole county the commissioners put the county convict forces to work, picking fruit to be destroyed in and close by the ascertained infestations, and other counties followed suit. The municipalities of Orlando and of Winter Park have taken a very active part in the clean-up work, as have numerous smaller municipal governments in the affected areas. Directors of the Orange County Chamber of Commerce voted to place the services of Karl Lehmann, its secretary, at the disposal of the Plant Board without pay, and Mr. Lehmann since has done valuable work. From California came seven citrus experts, including R. S. Woglum, entomologist for the California Fruit Growers Exchange. From Porto Rico came Dr. O. W. Barrett, entomologist formerly with the agricultural bureau of the island, retained by the Atlantic Coast Line R. R. to aid the present fight against the fly in Florida.

Building A Force

Additions to the original force of the Plant Board were made from the experiment station and the extension service, former workers in the citrus canker outbreak were hunted out and summoned by telegraph to Orlando, where they were cajoled or induced into joining at once in the battle against the fly. The United States Department of Agriculture sent a dozen of its foremost experts with experience in somewhat similar work against other pests elsewhere. From Texas came eleven men thoroughly seasoned in the recent fight there against the Mexican fruit fly, from the Middle West came men who had been fighting the hard but winning fight against the corn borer. Schools of instruction were opened where under the tutelage of experts, men with experience in similar things were taught the life habits, almost the thoughts, of this Mediterranean fly. Upon completion of this instruction and demonstration of ability these men became members of the ever-swelling corps of inspectors whose job it has been to hunt out and locate infestations of the fly. Under direction of M. R. Brown at Orlando this inspection force continues to grow while daily it searches out

the haunts of the fly.

Under Dr. A. F. Camp a great force has been created to dispose of fruit in the infested areas. In vicinity of Orlando and Winter Park, where the infestations discovered have been the thickest, over two hundred thousand boxes of fruit have at this writing been buried in a single great sand pit; and the work continues. In another place near Orlando a machine grinds oranges and grapefruit into bits so small the whole flows out like mush to fill in an adjacent swamp, after having been treated with live steam and chemicals to destroy larvae of the fly.

Right in Orlando a payroll of approximately \$4,000 per week for day labor engaged in fruit disposal, haulage and spraying has been accumulated, and the State Plant Board has to date gained the name of being an economical employer, almost to the point of being stingy.

From being a small institution the State Plant Board has in less than a month become one of the largest operators of automotive vehicles in Florida. Fleets of trucks engaged in haulage supplementing the automobiles necessary to transport the Board's workers in the field put it in the very front rank of gasoline users in the state. And there must be a place to store such equipment, and provision for necessary repairs, so that already the State Plant Board has found itself literally forced to become the biggest single garage operator in Florida.

Qualified chemists are studying this, that and the other methods of baiting and destroying the fly, the larvae and the pupae. Expert microscopists constantly study exhibits brought in from the field. Because of danger of confusion no infestation is definitely declared as such until after the material gathered by the inspectors in the field has been given positive identification under microscopes by experts. The microscope manipulators know no favorites, to them an exhibit is simply number so and so. Should it come from the grove of a personal friend their identification would be unaffected by that fact, for they do not know from whence the exhibits come.

A Pesky Pest

The Mediterranean fruit fly has been one of the best advertised and most carefully guarded against pests in recent years. Within the period of a hundred years it has literally girdled the earth; but its appearance in Florida is its first recorded advent upon the North American continent. The United States, however, has had

considerable experience with it since in 1910 it invaded its island possessions of Hawaii. In South Africa and in Australia the Mediterranean fruit fly has been controlled by the scientists who gave it battle. In Hawaii, despite great efforts to conquer it, the fly won and has overrun the islands. As a result only pineapples and Chinese bananas, which are gathered green, remain as commercial fruit crops of the islands. Concerning the failure of control and eradication measures in Hawaii Bulletin 640 U. S. D. A. says: " * * * this great abundance of dooryard and wild host vegetation has had a vital part in the undoing of artificial control measures."

Bulletin 640 gives a lot of excellent information concerning the fly, particularly in connection with the fight against it in the Hawaiian islands. It is worth careful reading by any Florida grower.

Many Infestations

To the time of this writing something between three hundred and four hundred separate infested properties have been located, posted and charted by employees of the State Plant Board. They extend very scatteringly from Duval County on the North to the southern portion of Osceola County at the time this is written. The heavily and closely infested area is in the immediate vicinity of Orlando and Winter Park, including the chief residential sections of those towns. From the Brevard County coast towns westward to Eustis and to Clermont in Lake County infestations have been located, posted and charted by employees of the State Plant Board. They extend very scatteringly from Duval County on the North to the southern portion of Osceola County at the time this is written. The heavily and closely infested area is in the immediate vicinity of Orlando and Winter Park, including the chief residential sections of those towns. From the Brevard County coast towns westward to Eustis and to Clermont in Lake County infestations have been located and mapped. Grove inspections still are proceeding, and more systematically now that the State Plant Board's inspection forces have been augmented. These are discovering additional infestations, and by the time this will appear in print the outline given above may be entirely out of date.

The Federal quarantine puts all infested properties and everything within one mile of their borders in Zone One, or the Infested Zone. Everything for the next nine miles

is placed in Zone Two, or the Protective Zone. Outside of that territory all of the rest of the state is in Zone Three.

No fruit may be shipped or hauled out of Zone One, and all fruit on the trees in that zone, together with all host plants, must be destroyed at once. This makes a tremendous job, which is employing thousands of laborers, whether engaged with the State Plant Board or individual growers or their organizations. Fruit from Zone Two may be shipped only to Washington, D. C. and points north thereof in the eastern states, and may move only under permit. Zone Three fruit is as unrestricted as if no quarantine existed, provided only it is washed, graded and regularly packed and carries permit exhibiting its origin. No fruit in bulk may be moved out of the state, either in trucks or railroad cars. The growers seem generally to feel that the quarantine regulations are as reasonable as anyone has a right to expect, and are willing to abide by them.

The Battle Is On

The experts from outside Florida, and the writer has had the privilege of contact with several of them, seem agreed that the Mediterranean fruit fly must be eradicated from Florida; that any halfway measures must prove futile. That generally is the opinion of Florida citrus growers sufficiently close to the infested districts to observe the quick multiplication of the flies therein, and the damage done fruit by their depredations.

That apparently is the attitude of the United States Department of Agriculture and of the Florida State Plant Board. Members of the Board itself, its officers and employees, and Plant Commissioner Wilmon Newell are, however, doing little talking, and no promising. Apparently they do not wish to be classed as alarmists and pessimists, nor do they as yet feel justified in indulging in optimistic utterances. Besides they are truly too busy to talk.

They are getting much aid from outside. Much of this is intelligent and truly helpful. Many of the concerns furnishing growers' supplies of one sort or another have turned their service men over to the State Plant Board, either as a body or as individuals. Many of these are proving extremely valuable in certain phases of the work. Professor Mortimer Culver, and K. E. Bragdon are two such men who may be mentioned. Many others are proving of equal value. These two gentlemen simply

Continued on page 21

Economic Phases of Grove Irrigation

E. F. DeBusk, Extension Specialist in Citrus Culture, University of Florida, Gainesville, Florida

The surface or flooding method is found to be the most practicable and most economical for citrus grove irrigation in Florida. Briefly stated, an installation for this method of irrigation consists of a main or permanent pipe line leading from the water supply to the highest part of the grove, equipped with outlets at convenient intervals, from which irrigation water flows by gravity or under low pressure through movable surface pipe lines or hose to all parts of the grove. Water is pumped into the main line by a centrifugal pump driven by a gasoline engine, electric motor or farm tractor. In the coastal sections, where a strong flow from wells can be obtained, irrigation water is usually carried through either ditches or main pipe lines alongside the grove, from which it is conveyed to the trees by means of smaller ditches and dams. The principal factors determining the economy and efficiency of the surface method of grove irrigation are (1) the capacity of water, (2) the size of the main pipe line, (3) the size of the surface pipe in relation to the capacity of the pump, (4) the number of surface pipe lines operated at the same time, (5) the method of distributing water from the surface pipe lines, (6) soil conditions and uniformity of distribution and penetration. An effort will be made to cover briefly the above mentioned factors in this paper.

Capacity and Size of the Mains

The capacity of an irrigation plant designed for a large acreage should be large enough to cover the grove or unit with two acre inches of water in ten days. For example, a plant for a 160 acre unit should have a capacity of 1400 G. P. M.; a plant for a 100 acre unit 900 G. P. M. Very few conditions exist where less than 700 G. P. M. is most economical. In designing an installation for a smaller acreage, the grower should be guided largely by the unit cost of pumping and applying water, as the cost of installations for operation under different working heads up to 75 feet will vary only slightly with different capacities. It is the operating cost that counts. For example, the cost of installing 1000 feet of 6-inch iron pipe main, equipped with pump and engine to deliver 900 G.



E. F. DeBusk

P. M. against a static head of 50 feet, is about equal to the cost of an installation with 1000 feet of 10-inch main equipped for delivering the same quantity of water against the same static head; whereas the cost of pumping water through the 6-inch main is about \$1.65 per acre inch, against approximately 65 cents per acre inch for the installation using the 10-inch main. In the 6-inch main about \$1.10, or 65% is consumed in overcoming the friction of the small pipe; in the 8-inch main only 10 cents or 16% can be charged to friction loss. The cost of pumping 900 G. P. M. thru a 12-inch main under the same conditions should not exceed 60 cents per acre inch. Thus it can readily be seen that strict attention should be given to the use of larger mains. Very few conditions exist where mains smaller than 8 inches can be used to the greatest advantage; especially is this true since concrete pipe is coming into general use for mains and is proving satisfactory. The capacity and size of the main should be matched so that the

loss of head due to friction does not exceed one-half foot per 100 feet of main.

Surface Pipe For Grove Irrigation

The following table shows the size of surface pipe (diameter in inches) recommended for different capacities and for different grades—fall per 100 feet of pipe line:

Gallons per minute	Fall 1" to 1'	per 1' to 2'	100 2' to 5'
300	7 to 6	6 to 5	5 to 4
450	8 to 7	7 to 6	6 to 5
700	9 to 8	8 to 7	7 to 6
900	10 to 9	9 to 8	8 to 7

The above table is based on the natural flow of water with different slopes of the pipe line. For example, should one desire to lay a surface pipe line 500 feet long, the outlet end of which is to be 5 feet below the intake and where the intake end is to be kept just covered with water, a 7-inch pipe will be needed to deliver 450 gallons per minute. Under the same conditions, an 8-inch pipe would be required to deliver 750 gallons per minute.

Where water is discharged from the main pipe line into the surface pipe line under pressure, which is usually the case, for each pound of pressure at the intake end, 2' 4" should be added to the total fall of the entire length of the line in determining the size of surface pipe needed for a given capacity. The fall per 100 feet is found by dividing .01 of the length of the line by the total fall—natural fall plus the fall allowed for pressure at intake end. If tight joints are made in the surface pipe line it makes but little difference whether the total fall comes in a few feet of the line or is uniformly distributed thruout the entire length.

The maximum length of a surface pipe line depends upon the contour of the ground, the amount of water to be delivered and the economy of the investment. It is more economical to handle the entire capacity, at least up to 800 or 900 G. P. M., thru one surface pipe line.

The weight or gauge of material that should be demanded by growers in purchasing surface irrigation pipe for the average Florida grove condi-

tions is as follows:

4 to 5 inch pipe—24 or 26 gauge
6-inch pipe—24 gauge
7-inch pipe—22 or 24 gauge
8-inch pipe—22 gauge
9 to 12 inch pipe—20 gauge

Lengths are 10 feet, 4 inches long. All elbows, tees, crosses and Y's should be made heavier gauge steel than is used in the pipe, and reinforced. It does not pay to buy the light weight pipe. It will not stand the strain. Surface pipe gets hard usage in grove irrigation. However, heavy weight pipe that has been in use for 12 years of five irrigations each is still in good condition. A lock-seam pipe soldered the full length of the seam is preferred. Both ends of all surface pipe should be reinforced. A very satisfactory way to strengthen the tapered end of the pipe is by means of a sleeve made with a special taper and riveted on. This sleeve makes it practicable to make a very tight-fitting joint without buckling the pipe. The other end of the pipe should be reinforced by means of a band or collar of steel riveted on in a true circle and left smooth inside. The band should be pliable enough to permit the end of the pipe to conform to the end of the other pipe inserted so as to make a tight-fitting joint.

For economical distribution of water, only one surface pipe line is needed in installations with capacities up to 800 or 900 G. P. M. By means of a system of crosses, equipped with outlet valves, distributors and hose connections, one man can distribute the full capacity of the surface line, up to 900 G. P. M. The method eliminates erosion, even on the steepest slopes, and makes practicable uniform distribution. In operation, water is delivered from the permanent pipe line into the surface line which is laid down the grade midway between the tree rows at intervals of two or three rows.

In laying the surface line, one of the distributing crosses is placed in the line at intervals of two or three tree rows. The distributing cross is equipped with butterfly valves by which the flow of water is regulated and cut off as desired. Suitable lengths and sizes of hose are connected to outlets of these crosses, by means of slip-joint nipples, to the opposite end of which are attached the distributing nozzles placed in position so as to distribute the water as desired. Water is then turned into the surface line from the permanent line and by adjusting the butterfly valves in the distributing cross, the flow of water to the nozzles is dis-

THE CITRUS INDUSTRY

tributed as desired. After the water has been allowed to run a sufficient length of time with the nozzles in the first place to give the required amount of water to the area thus covered the nozzles are then moved, one at a time in rotation, to new positions and a new area is irrigated. The operation is repeated, the surface line is moved over and re-laid as the area covered by the last one is irrigated, and so on until the entire grove has been irrigated.

Three types of distributing nozzles are used: the square type, 3 to 5 feet square and made of 3 or 4 inch conductor pipe; the tubular type, made of a straight piece of conductor pipe 10 feet or longer, and the drum type, 10 to 15 inches in diameter. All types of nozzles are made with 9 to 25 perforations for the discharge of water, $\frac{3}{4}$ to $1\frac{1}{2}$ inch in diameter, the number and size depending upon the size of nozzles, head of water and grove conditions under which they are to be used. The square type of nozzle is adapted to irrigation where the land is level or where the tree rows are not ridged; the drum type and tubular type are especially adapted to irrigation where the trees are planted on mounds or ridges; the tubular type is preferred for steep hillside irrigation.

Where the grade of the land to be irrigated is two to five feet to the hundred and where a large head of water is to be delivered thru one surface line laid down the grade water may be distributed by means of lateral lines of conductor pipe leading off two or three tree rows from the distributing crosses in the surface line, in lieu of the nozzles and hose connections. Such conductor pipe should be provided with outlets of about one inch in diameter, each equipped with a gate to regulate the flow of water, and at intervals of about one foot in the conductor line.

Problem of Penetration

The method of distributing irrigation water as above described has been developed thru an effort to obtain a more uniform penetration of irrigation water by our light citrus soils, and thereby increase their field capacity, to obviate erosion, and to reduce the labor cost of applying water; all of which have been obtained.

In grove irrigation in Florida we are constantly confronted with the problem of the low water-holding capacity of our soils under field conditions. We find our soils containing from 24 to 28 percent water when saturated and running below 4 percent moisture in the top foot soon after an application of 3 inches of

irrigation water, applied in the usual manner. A saturated soil that contains 27% moisture holds approximately 5 inches of water per foot depth. Theoretically, the same soil should contain approximately 16% moisture in the top foot as soon as it had absorbed an application of 3 inches of water. IF IT WERE UNIFORMLY DISTRIBUTED AND UNIFORMLY PENETRATED the soil. As a matter of fact, the field capacity of a soil for moisture is never equal to its saturation capacity, mainly because of lack of uniformity in distribution and penetration, but we must store more water in the soil by irrigation than is being stored under prevailing methods of applying water and under average soil conditions.

From a number of determinations, made, we find 64% to 96% of the entire root system of Florida citrus trees within the top foot depth of soil. This varies with soil conditions, age of trees and other factors. The best available information indicates that Florida bearing citrus groves need approximately three acre-inches of water per month or about one-tenth of an inch daily. About one-fourth of this is absorbed directly by the trees and the remaining three-fourths is lost mainly thru direct evaporation from the soil. Since the water extracted from the soil by a plant is in direct proportion to the root concentration in the soil, it can readily be seen that the demand for moisture made by the citrus tree upon the top foot of soil is very great, and that the efficiency and economy of grove irrigation depends in a large measure upon the uniformity of penetration and amount of water stored in the zone of highest root concentration.

In practice, we find that the amount of water stored in a grove soil—field capacity—is influenced by, (1) the rate of application, (2) running-dry areas, (3) dust mulch, (4) growing cover crop, (5) vegetable mulch, (6) tilth, and (7) contour of the land.

Instead of flooding an area with the full head of water from a single outlet of the surface line at the rate of 200 to 400 G. P. M., as is often the practice, more uniform penetration and a much higher absorption of water by the top foot is being obtained by dividing the head of water up into three or more outlets from the surface line, depending upon the volume, and applying it thru a large number of small openings as provided for in the above described distrib-

Continued on page 27

The Citrus Industry

with which is merged The Citrus Leaf

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ON TEMPORARY LEAVE OF ABSENCE

On May first, Frank Kay Anderson, assistant manager of The Citrus Industry, was drafted by the State Plant Board of Florida to aid in the fight being made against the invasion of the Mediterranean fruit fly. A few days earlier, C. D. Kime, horticultural editor of The Citrus Industry, was likewise drafted for work at the Orlando headquarters of the plant board.

This does not mean that either of these gentlemen are severing connection with The Citrus Industry, but merely that during the period of the fight against this pest, their first efforts will be directed toward the work of eradication.

The Citrus Industry can ill afford to spare the services of either of these gentlemen, even temporarily, but we recognize that in the present emergency, the Federal and State authorities have the first call on the time and abilities of every citrus worker.

It is, therefore, with a feeling of much regret, but nevertheless with a conviction that in granting temporary leave of absence to these fellow workers, we are "doing our bit" toward the work of eradication in which every loyal Floridian must join if the threatened disaster to Florida's citrus industry is to be averted.

As soon as their duties with the State Plant Board will permit, both Mr. Anderson and Mr. Kime will fully resume their important work on The Citrus Industry.

FLORIDA HEROICALLY MEETS

THREAT OF DISASTER

Discovery a month ago of the presence of the Mediterranean fruit fly in citrus groves in Central Florida, brought the citrus growers of Florida face to face with the gravest situation the industry of the state has ever been called upon to meet. Rumors of the threatened invasion were heard at the meeting of the State Horticultural Society in Clearwater, but it was not until the day following that meeting that the rumor was confirmed in official reports from Washington.

Immediate steps were taken by State and Federal authorities to combat the invasion of this most dreaded of pests, common in many lands and widely diffused over the world, but now for the first time gaining a foothold in the continental United States.

How the fly was brought to Florida is problematical. Many theories are advanced, but so far they are but theories. The main fact is that the fly is here and that it must be combatted with every resource of the state and nation. This fact was at once recognized by the State Plant Board and by the United States Department of Agriculture. Wholly inadequate, but prompt measures for temporary relief were provided by the State Legislature, and further appropriations are expected to meet the emergency. The Federal government likewise at once transferred \$4,250,000 from the unused fund appropriated to fight the pink boll worm, and this fund is now being used to aid the fight to eradicate the fly.

Dr. Wilmon Newell, Dean of the State College of Agriculture and executive head of the State Plant Board, was placed in direct charge of the work and established headquarters at Orlando, in the heart of the infested district, and here he has gathered about him the best minds of the state and nation in the work which he so promptly inaugurated. A strong organization has been built up, which includes the best known and most capable citrus experts of Florida, reinforced by able workers from Washington and experts from the citrus sections of California and Texas.

While most of these men are actively engaged in the aggressive field work demanded to meet the emergency, others are carefully and painstakingly studying the habits, the characteristics and the history of the fly with a view to discovering new methods of exterminating the pest.

Florida and the entire South is faced with a dire situation, one which threatens not only the citrus producer but all producers of fruits and vegetables throughout what is generally known as the cotton belt. With the fight in charge of Dr. Newell and his able assistants, The Citrus Industry believes that the war against the fly will be won. It may require much time and a vast amount of money, and it certainly will require the united effort of every Floridian, but if we keep our heads and refuse to become panic-stricken, we will eventually win.

An Appeal To All The People Of Florida

By Dr. Wilmon Newell

The government of the United States has spoken. The terms are hard and the conditions imposed seem almost beyond the possibility of performance. The significance of these federal regulations cannot be realized by the individual until he understands the losses and hardships they will entail upon him. Under all the canopy of heaven there is but one way of escape from these regulations, and that is by exterminating the fruit fly.

The need for eradicating the fly is desperately urgent. The time to do it is all too short, for if the fly can have a few months and the material in which to breed, the opportunity to stamp it out will be gone forever.

The response to our suggestion of a few days ago that growers, shippers and property owners gather and destroy all cull and fallen citrus fruits has been magnificent. Everywhere, throughout the infested area, volunteer workers by the thousands have turned to the task and countless thousands of boxes of fruit have been cleaned from groves and packing houses and given a speedy and effective burial.

However, just one ripe fruit overlooked or neglected may carry the fruit fly through, and I now appeal most earnestly to every citizen of Florida, from Key West to Pensacola, regardless of calling or color, to exert his efforts to the utmost to bring about an immediate and complete destruction of every remaining ripe citrus fruit in the state save only those which can be marketed under the federal regulations.

The task is far too great for the relatively small handful of trained inspectors in the employ of the United States and the state plant board of Florida.

And so I appeal to every citizen to get into the battle at once, with determination to win, and I appeal to all civic clubs, chambers of commerce, women's clubs, and all organizations of whatsoever character in the state to sound the cry of battle and rally the workers. To every Florida newspaper and editor; to every minister of the gospel; to every radio station, to at once display, repeat and broadcast this message and to instil in every human being in Florida the absolute necessity for action.

The enemy is upon us, we must fight now as never a people fought in time of peace—fight for our citrus industry, our business, and our homes.

A Floridian In The Rio Grande Valley

By Karl Lehmann, Secretary of the Orange County Chamber of Commerce

No Floridian could visit the Rio Grande Valley of Texas as I did in April without reaching some very interesting and definite conclusions about what is going on in that section. The editor of The Citrus Industry has requested that I jot down a few of them.

First of all I was impressed with the well organized and aggressive Chambers of Commerce in the valley. There are a group of capable secretaries of the type of Myron Ward of Harlingen, J. J. Bell of San Benito, and Richardson of Brownsville, who are doing excellent and well appreciated service for their communities and the valley as a whole. Texas has three well organized regional commercial organizations, the East Texas Chamber of Commerce, West Texas C. of C. and South Texas C. of C. that are doing effective work for their sections and doing a far better work for the state as a whole than most state Chambers of Commerce are doing. Texas has no state Chamber of Commerce.

There is a most pronounced "Valley spirit" along the Rio Grande in Texas and the communities and counties in this section are pulling together for the whole section which has much in common.

Many Chambers of Commerce in that part of Texas are operating with substantial sums of tax money from cities and counties and those that have financed their commercial organizations in part by this method are pleased with the results obtained.

Fruit off by March 1st

The Rio Grande valley is producing an excellent quality of grapefruit and there is a large acreage that will come into bearing in the next few years, a large enough acreage to be a serious competitor in our grapefruit markets.

J. M. Del Curto, chief entomologist of the Department of Agriculture, after a recent visit to the lower Rio Grande Valley, estimates a banner crop this fall.

George B. Terrell, commissioner of agriculture, expressed satisfaction with the present law, which requires that all fruit be removed from the trees by March 1. This fruit was stored in field boxes, unwashed, presum-



Karl Lehmann

ably waiting for a better market before washing, packing and shipping this citrus fruit. The Greininger 53 acres orchard (they refer to them as orchards instead of groves) near Mission, has only shipped three carloads of fruit this season. The balance of the fruit on this tract is in cold storage and will be shipped out later in the season. They have their own facilities for taking care of their fruit and little of it is ever marketed until after the rest of the Valley fruit is gone. John Wagner, manager, told a representative of Monty's Magazine that he began cutting his fruit and putting it in cold storage on the first of March, and that the early cut fruit is always best. They will have probably thirty-five or forty carloads of fruit in storage, among which is four carloads of early cut lemons.

Charles W. Volz, another Mission grower, will carry eight or ten carloads of his late cutting in storage at Houston, to be shipped out from there late in the season.

Cold storage plants at Weslaco and Pharr are doing a capacity business in storing fruits this season. Their past operation shows that handsome profits accrue to the farmers who held their products for a later market. This is especially true of cheap cabbage and late fruit.

The Rio Grande Valley Citrus Exchange in a circular letter sent out to its membership, urged the storage of fruit, and stated that they made arrangement for storage at Houston to take care of all their members.

The charges for storage will be 15c per box for the first month, and 10c per box for subsequent months. A

3c per box additional charge will accrue if it is necessary for the storage company to sort the fruit on reshipping.

At Weslaco, in the Valley, we had an interesting experience watching the packing and shipping of carrots. Beautiful vegetables brought in by the farmers in their trucks and unloaded at the packing houses and buying platforms, were being packed the day we were there. I think I have never seen finer carrots than the ones coming in to the platforms. I found that on Thursday, April 11, they were paying 25c a unit, which was five dozen bunches. Twenty-five cents for sixty bunches of carrots is not a very attractive price to the grower. These carrots were being put up in a most attractive package. Crates were lined with heavy paper, a layer of cracked ice put in the bottom, then a layer of carrots, then layers of ice and carrots alternating, until the crate was filled. The heavy paper was pulled up over the top of the carrots and the lid clamped down and nailed. The costs for packing these carrots were rather interesting. Labor for washing and packing, 20c; crate, 22c; ice 19c; paper, 10c; handling, 10c; a total of 81c packing cost for 25c worth of carrots. This figure becomes still more interesting when one is informed that the freight from Weslaco to New York on a crate of carrots is \$1.55, which makes a total charge of \$2.36 for labor and freight to handle 25c worth of carrots.

The vegetable growers of the Rio Grande Valley complain bitterly at the high freight rates, which is not entirely an unfamiliar complaint in Florida.

At the convention of the Southern Commercial Secretaries Association in Dallas, Lt. Gov. Hon. Barry Miller, congratulated Florida on the attitude of the railroads toward this state, and related an incident which occurred to him a few weeks before when coming out of Washington. He went into the diner for breakfast and asked the waiter for Texas grapefruit. The waiter told him he had only Florida grapefruit. Lt. Gov. Miller called for the steward and asked him why they served Florida grapefruit and not Texas. The steward told him the

Continued on page 16

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Tarpon Springs	Titusville	DeLand	Bartow	Homestead	Bradenton	Vero Beach	Miami

"Please Say You Saw It In The Citrus Industry"

A FLORIDIAN IN THE

RIO GRANDE VALLEY

Continued from page 14

railroad was controlled by Florida capital and the management permitted only the serving of Florida grapefruit.

Whether this report of the steward was correct or not, it is a fact that the Texas railroads, hotels and restaurants are certainly giving the producers of fruits and vegetables the finest kind of cooperation. On Southern Pacific diners throughout Texas we found special attention called to the fact that they served fruit and vegetables raised in the territory served by their lines. We found excellent Texas vegetables and grapefruit being served in hotels and restaurants generally, good sized portions, at reasonable prices. For example, at Harlingen we had a half grapefruit for breakfast prepared. "There wasn't a squirt in a carload." Contrast this kind of serving of grapefruit at a reasonable price to the attitude of many Florida hotels and restaurants. Often it is difficult to get Florida oranges and grapefruit and when we do get them the quality is poor, the portion is small and the price high. It would be a good thing for Florida citrus and vegetable producers if our hotels and eating places could be persuaded to serve liberal portions of high quality products at reasonable prices. Florida hotels this season have been known to serve a ridiculously small portion of orange juice and charge as much as 25c for it. A 25c service charge may be justifiable in a high type hotel and restaurant with heavy overhead, but there can be no excuse for a small portion.

One of the most interesting experiments in the distribution of Texas fruit and vegetables was the very effective work done by Mrs. J. C. Montgomery, who put on an "Eat Valley Products" week in Houston, Galveston, Dallas, Fort Worth, San Antonio and other cities, putting on an advertising campaign in the newspapers, talks by radio, to woman's clubs, Chambers of Commerce, service clubs, and sometimes in the schools, urging the people to eat the excellent products raised in the Rio Grande Valley. It is said that twelve more carloads of Valley fruit and vegetables were sold during the week she was in Houston than previously, and that the work done showed a substantial increase in the daily and weekly shipments to that market afterwards.

An example of the good work done by Mrs. Montgomery is found on the

THE CITRUS INDUSTRY

menu cards of the Plaza Hotel, San Antonio, setting forth in caps, black face type, the words: "We serve Valley vegetables exclusively." Other hotels and cafes have similar legends on their menus. Some include grapefruit. Practically every hotel in San Antonio and most restaurants are using Valley lemons, notwithstanding their immense size.

The production of lemons in the Rio Grande Valley has the problem of a market educated to the smaller lemons raised in Italy and Sicily, but substantial progress is being made in educating the people to using the larger and more acid lemons produced in the Rio Grande Valley.

The Southern Pacific has issued attractive literature and maps and their agricultural and industrial representatives have given excellent cooperation to the Chambers of Commerce and developers in the Valley.

Is There a Boom?

Going into the Valley a resident of that section commented on the fact that they had no boom in the Valley and didn't want one. A lady from Florida remarked, "If and when a boom comes, nothing you can do will stop it, and when the boom breaks and leaves you nothing you can do will prevent that." The resident of the Valley replied, "It is strange, but everybody from Florida tells us that."

Many folk in the Rio Grande Valley will tell you that they have no boom, but land companies claim that they are bringing from 10,000 to 12,000 homeseekers a month into the Valley, and that 60 per cent of them are buying lands. All up and down the Valley one sees Pullman cars on the side track which are being occupied by homeseekers excursions brought in by the land companies, largely from the Middle West.

The towns in the Rio Grande Valley seem active. Business seems good. There are all the earmarks of a boom, while it seems to manifest itself more in the sale of agricultural lands than it does in town lots. Yet, at one undeveloped point we found town lots selling at \$1,000.

Irrigation

Most of the orchards and farms in the Rio Grande Valley are operated by irrigation. There seems to be little or no tiling and sub-surface irrigation. Great irrigation ditches cover the Valley in all directions. There are some sections of the Valley where good crops are raised by "dry" farming. Some of the citrus "orchards" are on dry farming lands. Some idea of the need for irrigation is found in the following item from

May, 1929

the Edenburg Valley Review while we were in that section:

"Roma, April 10 (Sp)—Monday night at 9 o'clock the uninitiated might have thought that a revolution had broken out in Roma when guns were fired and loud shouts rent the night air. Investigation disclosed the fact that these people were celebrating the arrival of the first real rain that had fallen here in five months breaking a drouth that had become alarming. About an inch and one-half of water fell just in time to save corn which had reached a height of five inches and had begun to droop pitifully. The rains were general over this section and in Mexico as far south as Aldamas."

It is not uncommon to find towns in the Rio Grande Valley that have doubled their population in two, three, four and five years. While the growth has been rapid it seems to be of a substantial type. Beautiful homes, fine schools, churches, public buildings, and paving are every in evidence. Bus lines with hourly service operate on excellent highways.

Beautification

A pronounced and aggressive campaign for beautification marks progress in the Valley. Mercedes has perhaps made more progress in this direction than any other part of the Valley. Women's clubs, Chambers of Commerce, service clubs and business and professional women's clubs have cooperated in the planting of trees, shrubs and flowers. Beth Garrett, writing in Monty's Monthly says:

"City Beautification" in the Valley is taking on a new color this year. It has made a noteworthy gain in scope and breadth and depth. From little spasms of hibiscus and poinsettia plantings, and a few yard beautification contests, scattered up and down the Valley, and even into the rural districts of Cameron County.

"City Councils are busy making the approaches to their respective towns attractive. The ugly open drain ditch, which has been a catch-all for paper and trash, is fast disappearing. Chambers of Commerce are giving away flower seed and trees; civic clubs are organizing clean-up and beautification contests. Interest is being stimulated in 'correct planting.' The Valley is very seriously going about the business of making herself pretty.

"McAllen is another of those towns which is at present a gorgeous big flower garden, and why not, when her Chamber of Commerce gave away \$500.00 worth of flower seed. Her Mexican town shows a tremendous improvement due to this."

BLUE GOOSE NEWS

Monthly News of American Fruit Growers Inc.



Edited by The Growers Service Department

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PAGE 1

A CALL TO GROWERS TO LEND THEIR ACTIVE AID

By R. B. Woolfolk

By a swift succession of events Florida has been put face-to-face with a most critical period in the history of citrus production in this, the oldest citrus producing area of the United States.

Serious as the situation is, it is all the more a time for deliberate and cool judgment, and for coolness of action even when action must necessarily be speedy to accomplish results.

All resources upon which call has been made have responded promptly and with great liberality. We in Florida owe it to others as well as to ourselves to make the most of the opportunity which has been given us to eliminate the cause for our present uncertainties. The eyes of every other fruit producing section of our country are anxiously upon us.

Our State Plant Board has had thrust upon it suddenly one of the greatest emergency operations in the history of this country. Even with every aid and resource of the United States Department of Agriculture, and of other departments of the State of Florida, freely given, its task is as tremendous as it is urgent.

We owe to it loyal, hearty and intelligent support, coupled with obedience. Florida must eradicate and eliminate this pest; and unanimous and concerted action upon the part of every citizen and resident of Florida is essential to that elimination.

It is going to be necessary that we learn to think with unity concerning the problem before us, for unanimous thinking is essential to unanimous action. Not only must all citrus growers and shippers stand together in

face of this emergency, but necessarily we must educate our fellow citizens who have no direct interest in growing or marketing citrus fruits. It is essential that they think as we do, and see the situation as we see it, if they are to be expected to stand shoulder-to-shoulder with us. It is certain we must have their aid if we are to win speedily.

For it is in back yards and residential grounds most likely that this fight will be won or lost. History of similar efforts elsewhere clearly indicates this. Actual growers of citrus fruits in any quantity will have the true situation so forced upon their consciousness there is small doubt of their prompt compliance even in the face of hardship. It is to those to whom citrus production is a matter of indifference or of small interest we must address ourselves.

In order to inform others intelligently we ourselves must be fully and intelligently informed. Also we must proceed with diplomacy and tact in our task of education for it is the cheerful cooperation of our fellow citizens we shall need in preference to resentful compliance or surreptitious evasion.

It is a big educational campaign which has opened before us, and every grower may consider himself or herself enrolled upon the educational force which takes the field.

ANSWERING SOME

QUARANTINE QUESTIONS

The following are answers to some of the many questions that are daily being asked of this office in regard to the Federal and State quarantine regulations now in effect:

1. All host fruits and vegetables in the infested zones (Zones 1) must be destroyed immediately, and these zones must be kept free from susceptible fruits and vegetables until the zones have been declared free of infestation and released. Non-host fruits and vegetables, such as water-

Continued on page 2

HIGH CONSUMPTION OF ORANGES THIS SEASON

Per capita consumption of oranges in the United States reached a new high record during the present season. Combined orange shipments from both Florida and California for the month of March were at a rate to provide during that month approximately ten oranges for every man, woman and child in the United States. Per capita consumption of oranges during this season is now reported at the rate of 96, as against the previous high record of 57. Thus it is to be seen that the public has responded to the plentiful supply and generally reasonable prices of oranges to eat them at a rate nearly double that of past years.

Smaller sizes, of course, in part account for the increasing number of oranges used. However, taking smaller sizes into account it is yet to be seen that the public's use of oranges is considerably heavier than at any time heretofore.

Recent unexpected developments in the growing districts of Florida resulted in a rush of fruit into the markets and into cold storage which was not without considerable effect upon market prices for the time. However, that situation passed; and the trade's confidence in Florida citrus fruits has been well manifest by its takings of both oranges and grapefruit at fair prices. Demand has strengthened in the face of publicity which if not unfavorable did nothing to add to the desirability of Florida fruit in the eyes of purchasers.

With reduction in the visible supply of both oranges and grapefruit through removal of the products of some Florida shipping districts from the available list, and with lightened shipments a stronger tone is to be noted at the time this is written, with indications of the possibility of stronger prices by the time these lines appear in print.

California Valencias are later than
Continued on page 2

Adv.

BLUE GOOSE NEWS

OFFICIAL publication of the American Fruit Growers Inc., Growers Service Department, published the first of each month in the interest of the citrus growers of the state of Florida.

EDITORIAL ROOMS
502 Yowell-Drew Building
ORLANDO, FLORIDA



FOR AMIABILITY

Now comes a celebrated physician, Dr. George Walker of Baltimore, who after research and meditation prescribes oranges in the diet to promote amiability.

Irritable persons are not always to be blamed for their irritability, according to this medical authority. It may be too much acid in their alimentary canals which makes them hard to live with; and he prescribes oranges in the diet to provide necessary calcium hydrate to offset the acid tendency.

Facetious feature writers taking hold of Dr. Walker's recommendations are having a lot of fun. It is suggested that an orange a day will keep one out of the hands of the police; and that two oranges daily will make a previously irritable person as popular as Santa Claus after he has cured his halitosis.

It has also been suggested in the printed comment that divorce judges hereafter hand out oranges to the disputant parties instead of signing decrees; and that "an orange a day will keep the lawyer away."

All this, however, is good publicity for oranges, and good news to orange growers. The use of citrus fruits in the diet to correct acidity in the human system, because of the alkaline reaction in the system of ripe citrus fruits, has been gaining steadily in general recognition by the medical fraternity since certain discoveries to that effect some fifteen years ago, which were first given publicity in

Florida.

Let the public laugh at these exaggerated reports if it will, for even while it laughs it is learning something of value to it.

HIGH CONSUMPTION OF ORANGES THIS SEASON

Continued from page 1

usual this year, which very probably is due more largely to the abundant supplies of navels remaining than to any slowness of maturity. On April 6 California estimates were that 68 per cent of their crop had been shipped, as against 80 per cent a year previous at the same date.

Strawberries recently have been moving in volume. The cantaloupe crop, estimated to be about that of last year, is due to start somewhere about May 20. Apples in storage have been received very considerably, but are about ten per cent above last year's supply at the same time. The banana supply has been plentiful. All of these fruits have a bearing upon the consumption of citrus fruits with which they compete for favor upon the household table.

However, the outlook for Valencias and for Marsh Seedless grapefruit from Florida is apparently favorable from this time forward. Impossibility of anticipating changes of quarantine zones naturally makes it impossible to estimate fruit remaining for shipment with any degree of accuracy. This, in turn, makes market reaction extremely difficult to anticipate for more than a few days at the time. However, the generally satisfactory quality of both Valencias and late grapefruit are in themselves best assurances for their favorable reception from this time forward by both trade and consumers.

While a bit awkward to initiate, because of lack of experience with anything of the sort, the permit system is working out well. Aside from other features, the permit traveling with the waybill has the effect of assuring receivers of the fact that fruit does not come from an infested area. This governmental assurance of the truth of sellers' representations is not without value to the Florida industry at this time.

ANSWERING SOME QUARANTINE QUESTIONS

Continued from page 1

melons, pineapples, cucumbers and cocoanuts, may be shipped from Zones 1. The planting of host crops

in Zones 1 is prohibited.

2. All host fruits and vegetables in the Protective Zones (Zones 2) must be shipped or destroyed or processed by June 1st, 1929, and this Zone must be kept clean of any host fruits and vegetables until about November 1st. This is known as the host free period.

3. Citrus fruits shipped this season from Zones 2 must be destined through the Potomac gateway to Washington, Maryland, Pennsylvania and points north and east of Pennsylvania, except that Zones 2 fruit must be exported through Florida ports by special permit.

4. No bulk movement of host fruits or vegetables is permitted anywhere within the state or from the state to points outside except that fruit from approved groves may be moved in bulk to packing houses to be packed and shipped and except that fruit from approved packing houses may be moved under permit to canneries in screened or closed refrigerator or ventilator cars; also in screened trucks approved by the inspector.

5. Packing houses located in Zones 1 cannot pack and ship fruit from Zones 2 and 3. If a packing house located in Zone 3 by special permit packs fruit produced in Zone 2, such packing house then becomes a Zone 2 packing house subject to destination restrictions governing the shipments of Zone 2 fruit.

6. Fruit cannot be transported from Zones 2 and 3 through Zone 1 to a packing house. Once the fruit crosses the line into Zone 1, it can not get out and is subject to confiscation and destruction.

7. There are no restrictions upon the shipment of fruit produced in Zone 3 except that it must be packed in standard boxes and shipped under permit in refrigerator cars either iced or screened.

8. No fruit can be shipped from either Zone 2 or Zone 3 without a permit.

9. Neither the State nor the Federal regulations require the destruction of fruit bearing trees including ornamentals.

10. All regulations, state or federal, are subject to change from time to time as conditions may warrant.

Acreage in Spanish peanuts will be increased at least 200 percent in Wakulla County this year, states D. M. Treadwell, county agent.

WHY BUYING TRADE**PREFERS BLUE GOOSE**

It is an old story that the Blue Goose trade name enjoys a very considerable advantage because of the fact that it is before the public during fifty-two weeks in the year. Right now, when shipments from Florida are due to slack off before long, it is interesting to see how that advantage is derived from the widespread operations of the American Fruit Growers Inc.

Just at this time the public simply cannot escape giving daily attention to that Blue Goose trademark. There are Blue Goose Florida oranges, Blue Goose Florida grapefruit, Blue Goose Florida celery, Blue Goose Florida tomatoes, and, very shortly, Blue Florida watermelons competing for place in the foremost stores serving the discriminating section of the public which is able to pay for products of higher quality.

Then there are Blue Goose boxed apples from the Northwest, Blue Goose potatoes from Maine, Blue Goose new potatoes from the Carolinas, and Blue Goose cantaloupes from Arizona and California coming up for attention. Blue Goose strawberries from half a dozen states, too, will be there is all the markets to supply the demands of the particular.

Right on through the summer, right through the Dog Days of August, and through the Fall, until Florida citrus fruits again will come up for attention, the consuming public will look for that Blue Goose trademark as a surety of quality. And as the public thinks and acts, so thinks and acts the buying trade, whose profit lies in catering to the demands of the consuming public.

There is no such thing as "out of sight out of mind," where the Blue Goose trademark is concerned. On the contrary the large variety of non-competitive fruits and vegetables of the better sort which it is used to identify serve to keep it constantly up for attention.

That, however, is only one of the beneficial results of such operations to growers whose products travel under the Blue Goose trademark. They profit further by the economy which comes of keeping everyone in this great organization busy during twelve months in the year.

The representatives upon whom dependence is placed for actually ef-

fecting sales in the markets are placed in a commanding position through their ability to supply a large portion of the requirements of the trade in their respective localities. Nor do these representatives at any time get out of touch with that trade it is their duty to sell.

By reason of being a year 'round necessity to the better class of dealers everywhere, the Blue Goose trademark stands always at the top in the opinion of the trade, and naturally comes in for first consideration.

EXPORT GRAPEFRUIT**BUSINESS EXPANDNG**

Export shipments of Florida grapefruit under the Blue Goose trademark continue brisk to the time of this writing; and a new high mark of Florida grapefruit exports across the water has been set for this season by the Florida Division of the American Fruit Growers Inc.

The first Florida shipping concern to develop a continuous export business of grapefruit in quantity, the American Fruit Growers Inc. has been able to expand this business to a very considerable extent. The expansion is the result of special advertising and educational effort, and the satisfactory experience of earlier users abroad with grapefruit which came to them under the Blue Goose trademark. New customers have been created, and larger sections of the buying public in Great Britain and on the Continent have developed a taste for this delightful fruit.

Special effort has resulted in carrying the distribution of grapefruit out into smaller centers of population, and what was but a few years ago a luxury fruit in the principal cities shows signs of appreciation over an ever widening circle. The continued financial improvement in foreign countries, permitting more liberal expenditures upon the part of many of their citizens is, of course, a contributing factor of considerable importance in this wider consumption of grapefruit.

At first American tourists and residents abroad constituted the most important consuming element. To them grapefruit under the Blue Goose trademark came as an old friend. From this beginning the consumption of grapefruit has spread in a continuing circle until it is in these countries no longer a luxury fruit

for the wealthy, but is gaining friends steadily among many who but a short time ago regarded it as a curiosity beyond their reach.

REPORT SHOWS BRITISH**EATING MORE GRAPEFRUIT**

Imports of grapefruit into the United Kingdom during 1928 amounted to the equivalent of 751,000 boxes as compared with 606,000 boxes in 1927, according to statistics issued by the British Empire Marketing Board. The United States is the main sources of supply of grapefruit, shipping 592,264 boxes, or 79 per cent of the total in 1928. Florida ships the bulk of the fruit, but some quantities come from California making it possible for consumers to procure grapefruit practically every month of the year.

The hotel trade is the most important factor in the British demand for grapefruit and their preference is for small sizes which they serve as a cocktail course, using dishes which will not hold a grapefruit larger than a 96.

LOWER RATE UPON**EXPORT GRAPEFRUIT**

Several weeks of "diplomatic representations" have resulted in application by Florida railroads of the lower intrastate rate upon shipments of grapefruit for export via Jacksonville, instead of the interstate rate which was applied earlier. This results in an average saving of fourteen cents per box on such export shipments.

Contention that the lower intrastate, rather than the interstate, rate, should be applied to shipments for export via Jacksonville was initiated by J. R. Crenshaw, traffic manager of the American Fruit Growers Inc. at Orlando. The decision of the Supreme Court that oil shipments coming into Florida direct from foreign countries was business of intrastate, rather than interstate, character was held by Mr. Crenshaw to be applicable to the export of grapefruit via Jacksonville, as the business is originated in Florida and goes abroad without crossing the boundaries of another state. This view now prevails; and the results has been brought about by friendly negotiations which avoided necessity for hearings or court procedure.

UNIFORMLY



THE BEST

Why a NATIONAL Selling Organization

Not only is the selling force of the American Fruit Growers Inc. the largest and furthest spread of any handling perishable foodstuffs grown in the United States, it is essentially most permanent.

With a great volume of business built upon non-competing products of many sections it obtains that strength and permanence which is the result of diversification.

Its eggs are in numerous baskets, so to speak.

Crop failures or untoward developments in any one producing section are insufficient to affect materially its great national activities.

Growers who rely upon the American Fruit Growers Inc. to obtain the value of their crops in the markets do so with the assurance that its large and expert selling personnel will remain intact, and that merchandising efforts will be continuous and undiminished, even in times of stress affecting their own particular fields of production.

American Fruit Growers Inc.

Orlando, Florida

DEPENDABLE



QUALITY

MEDITERRANEAN FRUIT FLY

Continued from page 5

spots spread and an opening appears in the middle of each. Soon after this stage the fruit drops to the ground. The larvae complete their development in the fallen fruit and when full grown, a little over a quarter of an inch long, enter the ground to go into the pupal stage.

When the mean daily temperature averages 80°F. the immature stages are said to occupy from 18-20 days on the average. This is within a degree or two of the average mean temperature for central Florida for the months of June to September inclusive. At an average mean temperature of 68°F., approximately the mean temperature for March and April in central Florida, the average length of immature stages is said to be lengthened from 40-70 days.

After the larvae are full grown they leave the fallen fruit and enter the ground into which they may burrow to a depth of usually not over two inches. Often they do not enter the earth at all but pupate under a fallen leaf or other shelter on the surface of the ground. The pupa case is an oval body, light brown in color. The insect remains in the pupal stage between 9 and 11 days on the average in the summer time, although it has been known to emerge in as short a time as six days. During March and April they will probably remain in the pupal stage about 19 days, judging from the records in other countries where the temperature is comparable with ours at that season. The longest record for the pupal stages is 6 days. At the conclusion of the pupal period, the fly emerges from the pupa case and works its way up to the surface of the ground. At first the body is soft as is also the wings and the insect is not able to fly but the wings soon dry and harden and the insect flies away.

Although they are said to have been carried considerable distances by strong winds, adults do not fly far ordinarily. In a block of grapefruit trees near Orlando, the writer observed a comparatively light infestation except in the outside rows which were next to a block of mid-season oranges which had been picked sometime before. Here the infestation was very heavy. Over half the fruit was on the ground, and out of 20 fruits picked at random from one tree, 19 were infested.

Probably the most important means of scattering the pest is through transportation of infested fruits. For this reason the writer warns growers

THE CITRUS INDUSTRY

not to send any fruit suspected of being infested to the Experiment Station for identification, as such a procedure could very easily result in spreading the pest. The safe way is to collect any suspicious larvae or adult flies and place them in alcohol and send them to the Experiment Station in this shape. This will eliminate all danger of spreading the infestation.

FIGHTING THE FRUIT FLY

Continued from page 9

come to mind readily for the purpose of illustration. THE CITRUS INDUSTRY as a publication is contributing its share. C. D. Kime was conscripted at the very beginning; and about the first of the month

Twenty-one

Frank Kay Anderson was drafted into the fly-fighting service. General A. H. Blanding of the Florida Citrus Exchange, himself a member of the State Plant Board, is now devoting the bulk of his time to this work with the consent of the executive committee of the directors of the Exchange.

Orders come from Washington. These are mandatory and are not to be questioned. The workers of the State Plant Board's forces do not pause to question them, they act in accordance with them and try to act promptly.

They realize Florida must show speed in its campaign against the fly, and that the United States Depart-

Continued on page 33

**That You May Know**

why our Representative has not
called on you recently

The authorities who took charge of the grave situation which threatens the agriculture of Florida, accepted our prompt offer to place at their disposal our entire force of Field Representatives.

Now that the situation is more thoroughly in hand, half of these men have been released to us for sales work, but as these men cannot hope to call on you as often as formerly, may we ask that you mail your orders direct to our Jacksonville office for prompt attention.

Should you especially desire to consult with one of our Field Representatives, wire us and we will arrange for one of them to call on you without delay.

NITRATE  **AGENCIES**
1401-1403 LYNCH BUILDING JACKSONVILLE FLORIDA
COMPANY

IMPRESSIONS

By The Impressionist

Since the Bureau of Chemistry of the U. S. Department of Agriculture a couple of years ago changed the specifications of commercial vinegar, permitting citric in lieu of acetic acid and thereby opening the way for the sale in commerce of our old time orange vinegar, we have been urging the commercial possibilities of that product. Now we note that grapefruit vinegar is being made in quantity by a new Miami concern; and that it is stocked in a number of groceries in which we have been. We do not know these Miami folks who are thus blazing the way; but we can remember how Ralph Polk's small-scale experimental canning plant at Miami a few years ago laid the foundation for our present grapefruit canning industry. It is our impression that we have thus far only scratched the surface of our citrus by-products possibilities; and that the use of them in marmalades and sweets is only small part of the ultimate utility of our cull fruit.

S. B. Moomaw of London, England, who represents the California Fruit Growers Exchange and the Florida Citrus Exchange for export business, is reported as saying that Great Britain alone today consumes \$250,000,000 of various fruits annually. Yes, and this season both Florida and California might well have advertised their oranges as "grown especially for the Scotch trade."

For the first time in years we missed the annual meeting of the Horticultural Society. It was hard luck that necessary presence elsewhere made it impossible for us to participate personally at Clearwater. We were there in the spirit, however, for we regard the Florida State Horticultural Society as one of the State's greatest assets, and have been long accustomed to extract pleasure, as well as enlightenment, from its annual get-togethers.

We were greatly interested in a Homeland Grower's defense of seedling oranges trees in The Growers Own Page in the April issue. That community at Homeland in Polk

County, midway between Bartow and Fort Meade is given over wholly to seedling trees, and it is a most successful citrus community. We recall discussing this subject a few years ago with Mr. E. C. Stuart of Bartow, who is known to nearly every citizen in Polk County. At that time Mr. Stuart was the owner of a number of good grove properties, and was shipping fruit through several Polk County associations of the Exchange. It was interesting then to find that his seedling grove at Homeland was relatively the most profitable of his citrus holdings; and had been for several years. Personally, however, we would be inclined to give at least part of the credit for that to J. A. (Jim) Wilson, for many years manager of the Homeland Citrus Growers Association. Unheralded and unsung, the operations of this Homeland packing house in point of intelligent realization of marketing requirements, and efficiency combined with real economy set a mark for others to shoot at, in our humble opinion.

On that same page Mr. G. H. Preston of Crescent City took issue with our earlier statement concerning the inadequacy of the 8 to 1 test. Mr. Preston thinks if this test be applied only to oranges which show 25 per cent or more color before testing the results will be much more satisfactory. That may be true. We cannot dispute that. However, we feel that even then the 8 to 1 test will not constitute a sufficient assurance of palatability in the fruit which passes it. It is palatability, satisfactory or unsatisfactory eating quality, which makes or breaks markets; and it is our impression that ultimately the whole citrus growing world must come to realize it, or our troubles on this score cannot be ended.

On a visit to Tampa about two years ago, Mrs. Frisbie gave our wife a red carnation. From that we now have two big tubs chock full of carnations. All winter they bloomed bravely, and in the midst of the Spring drouth they were ablaze with blossoms. It rather looks as if we

were missing a bet in Florida not to grow more carnations for beauty.

Paging idly through the Ladies Home Journal for May we stopped abruptly at page 158. There beautifully done in natural colors was one of the finest grapefruit advertisements in recent years; and best of all a gift from the Kraft-Phoenix Cheese Corporation, so that it didn't cost Florida a cent. We bought some Kraft cheese at the grocery at first opportunity, as a small token of appreciation.

In the first weeks of the fly episode, Dr. Wilmon Newell head of the State Plant Board giving an excellent impersonation of a man with both feet on the ground in the midst of the excitement. Working sixteen to eighteen hours a day at the Orlando headquarters he failed to exhibit the presence of a nerve in his make-up. That went far to aid in bringing order out of chaos and to instil confidence. By the bye the Federal Horticultural Board evidently felt some of that confidence when it gave Dr. Newell charge of the Florida field work in its behalf.

Fortunate for our industry that it is directly represented upon the State Plant Board in the person of General A. H. Blanding. A better qualified or more fitting representative would be difficult to find in the ranks of citrus people.

Then W. M. Scott, manager of the Florida Division of the American Fruit Growers Inc., has been of unusual value in the emergency. Messrs. J. C. Chase, C. C. Commander and John A. Snively contributed of their time and effort before the Federal Horticultural Board and their efforts in behalf of Florida were valuable. Mr. Scott, however, as former head of one of the bureaus of the U. S. D. A. was right at home with the people in Washington, speaking their language and sharing their thoughts. He was thus able to sit in intimately upon the proceedings, and to contribute thoughts of value to Florida while the quarantine regulations were in preparation.

Starvation?

It is now clearly understood that citrus growers located in Zone One will not be allowed to mature a crop upon their trees for next season. Such fruit must, according to the regulations, be removed before it reaches a "susceptible stage of maturity."

No definite word has come concerning possible compensation for such removal, but in the best posted circles it is felt quite possible the authorities may favor some compensation for next season's fruit thus removed prior to maturity.

However, it is certain that all effort will be centered upon the attempt to "starve the fly." Also, it is known that the fly feeds upon the honey-dew of other insects such as white-fly, mealy bug, scale and aphids.

Therefore groves allowed to go unfed and untended to an extent that they harbor large quantities of such pests not only will not aid in the work of eradication, but actually may aid the fly to survive the campaign of starvation.



Florida Insecticide Company

Apopka, Florida

Clearing House Membership Drive

A two-months' intensive drive for new members of the Citrus Growers' Clearing House Association opened May 8 and will continue until the latter part of June when the organization hopes to have increased its



A. W. Hanley

membership by several thousand growers. The entrance of the Mediterranean fruit fly into Florida, characterized as a serious menace to the whole industry, adds to the argument for a state-wide medium through which the voices of all connected with the industry can be heard, leaders point out, and should be a strong factor, they say, in bringing to the minds of all growers, more forcibly than ever, the realization that all must stand or fall together.

The campaign set-up includes practically the entire personnel of the Clearing House membership. The machinery revolves about the Committee of Fifty which recommended a membership campaign more than a month ago.

When the campaign was approved by the Board of Directors, they adopted a resolution, requesting all members of the Committee of Fifty, the Operating Committee and the Board of Directors, all to put their shoulders to the wheel and carry on an effective membership campaign.

Hanley in Charge

At the same time the Board selected A. W. Hanley, official statistician and in charge of pro-rating

and also the Clearing House publicity department, as campaign manager. Mr. Hanley was selected because the problems of a membership campaign are familiar to him. He helped the Committee of Fifty in the initial membership drive last Spring and Summer, and, in fact, it was due largely to his efforts that the campaign resulted in the success that brought it to a close last July 1st with the final formation of the Clearing House.

Immediately after his selection by the Board, Mr. Hanley outlined his plans for the set-up, which plans were at once approved by the Board of Directors and the Committee of Fifty.

This Committee of Fifty, which is the Growers' Advisory Board to the Board of Directors of the Clearing House, willingly and generously put at the disposal of Mr. Hanley its bulwark of strength in the canvass, assumed full responsibility for selecting the campaign personnel under the direction of Mr. Hanley, and of

gaining and holding local enthusiasm and support in every citrus community of the state.

Approximately 400 workers will be utilized in the groups of canvass-

For Real Scale Control

Because of its wide margin of safety VOLCK can be applied to your trees in sufficient strengths for real control of Scale and other insect pests during the period when the Scale hatch is at its height. No other spray combines safety and effectiveness in the same degree.

Talk with your nearest dealer

CALIFORNIA SPRAY-CHEMICAL COMPANY
O. R. Blois, District Sales Mgr.
61 W. Jefferson St., Orlando, Fla.

VOLCK

The Scientific Insecticide

AMMO PO



The original, natural product, containing 32% pure plant food—Finely ground for easy distribution.

Is the Top Dressing You Want for Best Results and Biggest Profits

Use AMMO-PO to your profit for beans, tomatoes, cukes, watermelons, etc. Use AMMO-PO for citrus to increase the size of the fruit—for early opening of the bloom and starting of fruit.

It's A Big Labor Saver

Why handle a 100 lb. bag of 14% potash and another 100 lb. bag of nitrate of soda, 18% ammonia—when 32 lbs. of AMMO-PO plant food in one bag, handled by one man with one operation, will bring better results?

AMMO-PO—an exclusive original top or side dressing, is "Best by Test"—according to hundreds and hundreds of your brother farmers and growers.

AMMO-PO contains 18% ammonia, in the same pure form as nitrate of soda, and 14% potash in a pure, quickly available form. It does not contain borax or chlorine.

By all means, use AMMO-PO if you want best results. Write for details and prices.

Atlantic & Gulf Fertilizer Co.

C. Nash Reid, Pres.
JACKSONVILLE, FLORIDA

May, 1929

ers, nine out of every ten of these being volunteer workers. A sub-committee of the Committee of Fifty, known as the Credentials Committee, met Monday, April 29th, to select the key-man from the recommendations made by the members of the Committee of Fifty in their respective communities to direct these rapid-firing squads in the different sections.

Volunteer Helpers

Mr. Hanley's plans, which have been

THE CITRUS INDUSTRY

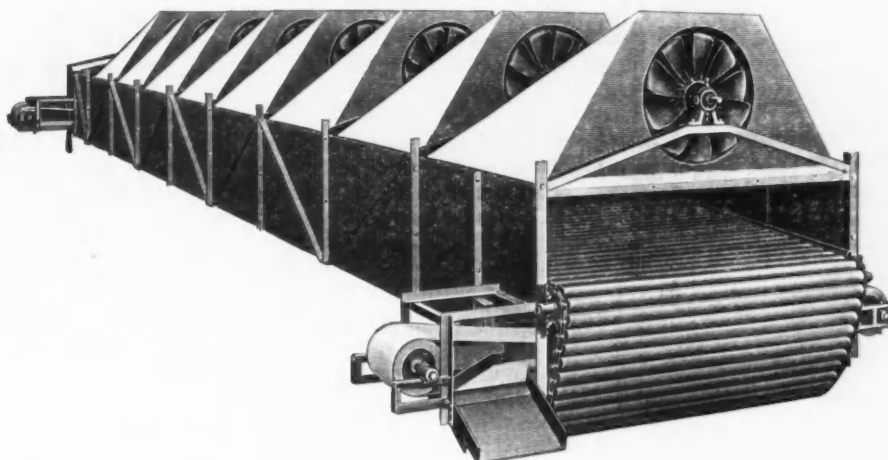
wholly accepted, call for 15 to 20 volunteer assistants for each of the key-men or leaders in the seven electoral districts into which the citrus section has been divided by the Clearing House. Each key-man will maintain close contact with his assistants and direct them in their efforts to bring all growers into the organization. Mr. Hanley will supply lists of prospective members to each key-man to be issued to all canvassers.

Twenty-five

To maintain a close-knit organization, state-wide in scope, throughout the campaign, three men will be utilized to travel from county to county for conferences with the key-men and to keep the entire canvassing machine functioning smoothly and effectively. Groups with weak links will thus be built up so that the best results may be produced and the group helped over the difficult places.

Individual members of the Clear-

The Skinner Multi-Fan Duplex Dryer



Packers considering the purchase of new drying equipment for next season should visit some of the houses where this new Skinner All-Steel Multi-Fan Duplex Dryer has been installed and watch it perform.

By adding a fan every 5 feet of length we introduce fresh dry air at every 5 foot section, whereas with the old type of dryer with one fan air was taken in at only on point.

This change has greatly improved the drying efficiency of the machine as well as increasing the capacity from 4 cars per day to 6 cars per day for the same size dryer. Another improvement we have made is to build it of all steel. This provides a more rigid construction than wood, will always stay in alignment and last longer.

This is only one unit of the long line of all steel packing house machinery now built by Skinner. If considering replacements or an entire outfit a Skinner man will be glad to discuss details with you and submit a definite proposition.

**Come To Headquarters For Anything in The
Packing House Machinery Line**

Florida Citrus Machinery Company

B. C. Skinner, Pres.

Dunedin, Florida

"Please Say You Saw It In The Citrus Industry"

ing House, not enlisted in the group personnel, will also be utilized in soliciting new members. Mr. Hanley proposes to send to present members of the Clearing House a list of growers in the individual member's community who are not affiliated with the Clearing House. With the individual member signing up one or two of his neighbors, it is calculated that several thousand growers can be reached effectively by neighbor growers who are already members.

Prizes Offered

Prizes will be distributed among canvassers to stimulate effort in signing up new members. Mr. Hanley has succeeded in raising \$500 among a few Clearing House leaders to be given as prizes. Mr. Hanley emphasizes that this money does not come from the Clearing House but instead from volunteer subscriptions made by loyal boosters of the Association.

Fifteen prizes will be awarded a-

mong those who get the most new members. The first prize is \$200. A second prize of \$100 will be given to the runner-up in the number of new members signed up. The third prize is \$50, with the fourth and fifth \$25 each. There will be three prizes of \$15 each, four of \$10 each and three of \$5 each.

The Board of Directors will be the sole and final judge of the awards, and must announce their decision by July 1st.

The Brogdex System of Decay Control

Gets Results

Here Is What Some Buyers Say:

"Brogdrexed fruit in our judgment shows up much better on arrival and think that it means better prices realized upon same."—Consolidated Fruit Auction Co., Cleveland.

"Your Brogdrexed Treatment properly applied is cheap insurance for any citrus shipper."—Jerome A. Larocco & Co., Chicago.

"Congratulations on new treatment. Fruit looks alive and fresh. Trade values accordingly."—Sawyer & Day, Boston.

"We believe all interested parties, growers, shippers, railroads, distributors, jobbers, retailers and last but not least, the consuming public, are all benefited."—Kingman & Hearty, Inc., Boston.

"It is our opinion that the expense of treating fruit in this way is well warranted by the results accomplished."—J. & H. Goodwin, Ltd., New York.

"We think this a wonderful success as it keeps oranges from decaying. We handle a good many oranges for the M. O. D. people and think we know what we are talking about."—Guy W. Glass Brokerage Co., Memphis.

Licensed Houses

Chase & Co., Orlando, 14 houses
Mammoth Grove, Lake Wales
P. H. Varn, Plant City, 5 houses
R. W. Burch, Inc., Plant City
E. C. McLean, Palmetto
Chester C. Fosgate, Orlando
Nevins Fruit Co., Titusville, 2 houses
Milne & O'Berry, St. Petersburg
Adams Packing Co., Auburndale
DeLand Packing Co., DeLand
W. E. Lee, Thonotosassa
L. B. Skinner, Dunedin
Tampa Union Terminal Co., Tampa

It reduces losses from blue mold and stem end rot. Dealer and packer tests show remarkable control. One packer has shipped over 300 cars WITHOUT ICE and no decay loss. A dealer reported to his packer that he had kept a box of his tangerines 2½ months without losing a single fruit and without apparent shrinkage or evidence of aging.

It reduces icing charges. Fruit put through the Brogdex process can be shipped without ice if it has not been broken down in the coloring room or late in the season when it is over-ripe. At an average saving of 20c a box this alone would more than justify Brogdex.

It improves the appearance. Many buyers of Brogdex treated fruit state that fruit so treated arrives in better condition, looks better and sells better.

It is especially beneficial if fruit is to be kept in cold storage since it controls decay and retards shrinkage.

Packers know what Brogdex will do and are generally favorable to its use. The objection comes largely from growers who object to the few cents extra the packer must charge to put his fruit through the Brogdex process.

Growers may fully inform themselves upon the advantages above mentioned by visiting any of the houses using the system or talk to growers whose fruit they handle. A letter to this office will bring full information.

Florida Brogdex Distributors Inc.

B. C. Skinner, Pres.

Dunedin, Florida

ECONOMIC PHASES OF GROVE IRRIGATION

Continued from page 11

uting nozzles. By this method water is allowed to run in less volume, and consequently over a longer period to give the required amount. This gives time for it to soak in, and the numerous small outlets make practicable a more uniform distribution, at the same time reducing the labor cost of applying water 50 to 75 percent and eliminating the problem of erosion.

Water flowing at the rate of 300 G. P. M. from a 5-inch surface pipe has a velocity of 294 feet per minute as it leaves the pipe and will result in much erosion in our sandy soils, as 70 feet per minute is the maximum safe velocity. Besides, when water is rapidly flowing over the surface of our sandy soils very little is soaking in. It flows to low areas and is absorbed most rapidly by areas containing the highest percentage moisture because of low root concentration, where irrigation is not so much needed. It is only by applying water very slowly that the driest areas, the areas of highest root concentration, can be wetted. Thus it can readily be seen why we get such a low field capacity by the usual flooding method. The soil is wetted only in spots while the roots in the dry areas suffer.

Since it is so extremely difficult to wet a soil that has been allowed to thoroly dry out a special effort should be made to distribute the irrigation water so as to prevent the exhaustion of moisture in areas of high root concentration, where the greatest demand for moisture is made.

Growing cover crops aid materially in the distribution of irrigation water and make practicable more efficient irrigation than can be obtained on the cultivated soils, especially on the dust mulch. A mulch of vegetation is very helpful in distributing irrigation water, besides it greatly reduces the loss of water resulting thru direct evaporation from an unprotected soil.

It seems that the solution of the problem of producing fruit of better quality and at a lower cost is based upon the problem of supplying more and cheaper organic matter to our groves, and of substituting, in a large measure at least, irrigation for cultivation. Undoubtedly such diseases as dieback, ammoniation, frenching, blight and splitting of fruit, are closely associated with a deficiency of organic matter in the soil and an inadequate and irregular water sup-

THE CITRUS INDUSTRY

ply. Much of the dead wood in our bearing trees is the result of drought injury.

With irrigation water at less than 75 cents the acre inch applied; with such cover crops as *Crotalaria* producing up to eleven tons of dry material per acre in our groves; with our idle lands, truck farms at off seasons, and even the Everglades, to draw upon for growing cheap organic material to supplement the cover crops in our bearing groves; we should be able to make even our light soils respond in successful competition with our keen brothers of the West.

Walton County Girls are all electing nutrition and health this year. January was spent in making needed

corrections in food and health habits and in physical defects.

Twenty-seven

C. D. Kime

Consulting
Horticulturist

Grove Advisory Service,
Soil Investigations,
Research.

P. O. Box 222
Phone 3489
ORLANDO

Ripen, color, blanch with ETHYLENE

Increases profits—Saves time—Reduces losses



Inexpensive

Easy to use

All these advantages

1. Greatly reduces time required for ripening.
2. Prevents waste from rots and fungous growths.
3. Improves flavor.
4. Produces better color by more complete action on the green pigments.
5. Ripening and coloring go on simultaneously.
6. Makes possible the marketing of heretofore unknown tropical fruits.
7. Ripens and colors fruits and vegetables that mature late in the season.
8. Is inexpensive and easily used. Simple apparatus and little experience required.
9. Can be applied equally well to a few crates or a whole carload of fruit or vegetables.
10. Is neither injurious nor dangerous. Widely used. A proved success.

For information write to

CARBIDE AND CARBON CHEMICALS CORPORATION

30 East 42nd St., New York City

P. O. Box 596, Los Angeles, Calif.; 114 Sansome St., San Francisco, Calif.

Warehouses in Tampa, Jacksonville, Los Angeles and other principal cities

Unit of Union Carbide  and Carbon Corporation

"Please Say You Saw It In The Citrus Industry"

Twenty-eight

MEDITERRANEAN FRUIT FLY QUARANTINE EFFECTIVE

MAY 1ST, 1929

Continued from page 6
shipping the fruits from any premises of the discovery of an infestation of the Mediterranean Fruit Fly on such premises or of failure on the part of the owner or manager of such premises to comply with any other restriction of these regulations."

6. "No restrictions are placed on the interstate movement of host vegetables grown in and moving from any part of a quarantined State outside of a protective zone, except that tomatoes shall be shipped green in standard commercial crates, baskets, or boxes and transported in refrigerator or ventilated railway cars."

Marking Requirements (Regulation 10)

"For all shipments in less than car lots, each box, crate, or other container of the articles for which permits are required by these regulations shall be plainly marked with the name and address of the consignor and shall bear securely attached to the outside thereof the permit issued in compliance with these regulations. In the case of car lots, no certification will be required of individual boxes, crates, or other containers, but the permit shall accompany the waybill covering such shipment. All conductor's manifest, memoranda, or bills of lading pertaining to such shipments shall be marked with the number of the permit, and with such instructions with respect to cleaning of said cars as are given in such permit."

Nursery Stock (Regulation 9)

"Nursery stock, including all kinds of plants and plant roots except portions of plants without roots or soil, shall not be moved or allowed to be moved interstate from the quarantined State to or through any point outside thereof unless a permit shall have been issued therefor by the United States Department of Agriculture. Permits may be issued for such interstate movement upon determination by the inspection either (a) that the nursery in question was so situated and so protected as to eliminate the risk of soil infestation by larvae and pupae of the Mediterranean fruit fly, or (b) that the said articles have been so cleaned or treated as to eliminate any danger of their carrying the Mediterranean fruit fly, or (c) that the said articles have originated outside any protective zone.

Restrictions on the Interstate Movement of Sand, Soil, Earth, Peat,

THE CITRUS INDUSTRY

Compost, and Manure, Regulation 6

(1). Soil, earth, compost, and manure of any kind as to either bulk movement or inconnection with other articles shall not be moved or allowed to be moved interstate from an infested or a protective zone to or through any point outside thereof: Provided that this shall not apply to Fuller's earth, Naolin clay, phosphatic sand or clay, peat, or muck and similar mined or dredged products, including sand, when in the judgment of the inspector such movement does not carry any risk of spreading the Mediterranean fruit

fly.

(2). No restrictions are placed on the interstate movement of sand, soil, earth, peat, compost or manure from points in a quarantined State outside protective zones.

Regulation 7. Restrictions on the Interstate Movement of Railway Cars, Boats and Other Vehicles and Containers

(1) Railway cars, boats, and other vehicles and containers which have been used in transportation any article whose movement is restricted by these regulations within or from a quarantined State, shall not there-

Over \$3,000,000 loss to



FLORIDA CITRUS GROWERS

Can be quickly and economically prevented

Rust Mites according to recognized authorities are causing Florida Citrus growers over \$3,000,000 in lost income. Start now to kill these Rust Mites which are causing so much of Florida Citrus to be "russet" and "golden"—lowering the price on your fruit.

Anchor Brand Velvet Flowers of Sulphur is a quick *economical* way to produce more "brights" and to help you make Florida Citrus and *your* crop the brightest, clearest and most popular in the land. That will mean a better price for your crop.

Dusting with this 100% pure, powerful *fuming* sulphur is the *more economical* way.

The reason for Anchor Brand (Flowers of Sulphur) superiority and economy is its purity and extreme volatility. It is finer, fluffier and free-flowing.

And, only a little more than half the amount of Anchor Brand is needed to do a better job than ordinary sulphur. If you have never dusted with this more effective and economical Flowers of Sulphur, then try Anchor Brand.

Write for the helpful booklet offered in the coupon below

Stauffer's ANCHOR BRAND

VELVET FLOWERS OF SULPHUR

DISTRIBUTORS: SHERWIN-WILLIAMS CO., JACKSONVILLE, WINTER-
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Please send me a free copy of "Dusting, Spraying
and Soil Sulphurs."

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C-1-13

"Please Say You Saw It In The Citrus Industry"

after be moved or allowed to be moved interstate until these have been thoroughly cleaned and, if required by the inspector, disinfected, by the destination carrier and (or) the consignee at the point of unloading in manner and by method prescribed by the Plant Quarantine and Control Administration.

Regulation 8. Restrictions on the Interstate Movement of Packing Equipment and Other Contaminated Articles

Fruit-packing equipment and articles which have been associated with the production of, or commerce in fruits and vegetables or are have been contaminated with soil, earth, peat, compost, or manure, shall not be moved or allowed to be moved interstate from the quarantined State to or through any points outside thereof unless a permit shall have been issued therefor by the United States Department of Agriculture. Permits may be issued for such interstate movement upon determination by the inspector that the said articles have been so cleaned or treated as to eliminate any danger of their carrying Mediterranean fruit fly.

Regulation 11. Inspection of Restricted Articles in Transit

Any car, vehicle, basket, box, or other container moved or offered for movement interstate which contains or may contain articles the movement of which is prohibited or restricted by these regulations shall be subject to inspection by inspectors at any time or place.

Regulation 12. Cancellation of Permits

Any permit issued under these regulations may be withdrawn or cancelled by the inspector and further permits refused, either upon determination of infestation on the premises on which the articles concerned are or have been located, or for any violation of these regulations, or of the permittee's agreement, or whenever in the judgment of the inspection the further use of such permits might result in the dissemination of the Mediterranean fruit fly. After any such permit is withdrawn or cancelled, the further use of any permit tags issued thereunder is prohibited.

A corn variety test has been planted in Escambia County under the direction of E. P. Scott, county agent. Five yellow and six white varieties were used.

All a musician does for a living is play around.—Yellow Cab.

Pick More DOLLARS

*from your trees
and from your gardens*

LARGER crops of crisp, firm, flavory vegetables—fruit that is juicier and of better shipping quality—when you fertilize with Chilean Nitrate of Soda. Crops will mature earlier and bring a higher market price.

The value of Chilean Nitrate has been conclusively proved by thousands of prosperous Florida farmers. It has been the standard nitrogen fertilizer used by successful growers for over 50 years, on all types of farms and on all kinds of crops. Its nitrogen is immediately available, starting to work as soon as it is applied.

Chilean Nitrate is the world's only natural nitrate fertilizer. It is not synthetic.

New Fertilizer Book FREE

Our new 44-page book, "How to Use Chilean Nitrate of Soda," tells how to fertilize truck, citrus and all other crops. Ask for book No. 1, or tear out this ad and mail with your name and address.

**Chilean
Nitrate of Soda**
EDUCATIONAL BUREAU



Orlando Bank & Trust Bldg.
Orlando, Florida

In writing please refer to ad No. I-25

Thirty

HOWEY WANTS STATE COMMISSIONER OF CITRUS

Creation of the office of commissioner of citrus for Florida is provided in a bill sponsored by the Growers Legislative committee, W. J. Howey, chairman.

"Every effort will be made to have this bill enacted into law by the legislature now in session at Tallahassee," said Mr. Howey. "The Growers Legislative committee believes the citrus industry of Florida is of such importance that the state should have an able commissioner whose entire time can be devoted to this work.

"At present this endeavor is in the hands of the state secretary of agriculture. In Florida the secretary of agriculture is compelled to sit upon some 19-odd boards, and at the same time administer the affairs of his own department. Obviously, it is impossible for any human being to effectively superintend law enforcement and all the other activities vital to the citrus industry when he is hampered by such a multiplicity of tasks.

"Because of this and because of the ever increasing importance of citrus growing, long the basic industry of the state, the Growers Legislative committee is alert to the immediate need of a commissioner of citrus. Certainly, a competent commissioner could at this critical period be of inestimable value.

"The Growers Legislative committee also will urge that the green fruit shipment restrictions bill now pending in the senate be amended in the House of Representatives to extend the time of inspection of oranges from Dec. 1 of each year to Dec. 31. The committee is convinced that this is essential if the market is to be protected against the shipment of green fruit."

FERTILIZATION OF THE VALENCIA ORANGE

Continued from page 7

have been only partially successful. Regularity of rainfall has been a factor beyond control.

Irrigation, with the help of slow acting organic analysis and the elimination of chemicals, may yet enable the grower of Valentias on the Sand Hills of Florida to come through with a product which, in texture and weight, will do credit to any fruit district in the state. This very thing is being accomplished today by some, but the percentage of such high grade fruit must, and can be greatly increased.

THE CITRUS INDUSTRY QUARANTINE INSPECTOR DESCRIBES DAY'S WORK

Quarantine inspectors of the State Plant Board located at Miami are having to extend themselves to keep check on plants brought into the state from foreign countries since the establishment of the new air routes recently. Following is a quotation from a letter sent in to headquarters here by one of the inspectors, on March 24.

"So far this month there have been 240 entries of boats and planes at Miami. It looks as if we will break last month's record. Yesterday was an off day we had but seven foreign planes, six foreign and two domestic

ships.

"Today the Shawnee came in from Cuba with 362 passengers; the "New Northland" docked with 107 passengers. There were 1,022 pieces of baggage on these two ships. Mr. McCarter's big yacht came in from Havana; Colonel Brinkman's yacht and four planes are due this afternoon. It is just 3:30 now and there may be some late ones yet.

"I got the first bug specimen from the Havana plane, some green scale, on a jasmine corsage bouquet. That puts the airplane in the class of real dangers when it comes to bringing in foreign plant pests."

For Quality Fruit and Vegetables



KILL INSECTS!

AS A SPRAY, "Black Leaf 40", Nicotine Sulphate, kills aphids, thrips, leaf-hopper, red-bug, psylla, etc., both by contact and by its nicotine fumes. Combine it with Lime Sulphur, Lead Arsenate, Bordeaux, etc., if you wish, and make one spraying do double duty.

AS A NICOTINE DUST, for orchards, truck crops and gardens, mix "Black Leaf 40" with an alkaline carrier such as Hydrated Lime, as described in our free spraying and dusting chart.

"BLACK LEAF 40" is the world's leading nicotine insecticide. Endorsed by Experiment Stations. Deadly to all soft-bodied sucking insects. Non-injurious to foliage. Ask your Experiment Station.

KILLS BY CONTACT and FUMES

While the effectiveness of "Black Leaf 40" is primarily dependent upon direct contact (wetting), a secondary advantage is furnished by the "gassing" effects of the penetrating nicotine fumes set free in the spraying material. This two-fold action is an advantage not possessed by any non-volatile spraying solution.

"BLACK LEAF 40" CONTROLS POULTRY LICE

The treatment requires only a small paint brush, a can of "Black Leaf 40" and a few minutes' time for "painting" the solution on top of the roosts. Easy, effective and cheap. Eliminates all individual handling of birds. Ask your Dealer for information or write us.

TOBACCO BY-PRODUCTS CHEMICAL CORPORATION, Incorporated
Louisville, Kentucky

"Black Leaf 40"

40% Nicotine



"Please Say You Saw It In The Citrus Industry"

Smith's Edition

**EDWIN SMITH RESIGNS
FOREIGN POST AS AGRICULTURAL COMMISSIONER**

The resignation of Edwin Smith as foreign agricultural commissioner of the Bureau of Agricultural Economics, United States Department of Agriculture, to become vice-president of a Northwest apple export company with headquarters at Seattle, Washington, has been announced by the department, effective June 30, 1929.

Mr. Smith has been associated with the Department of Agriculture almost continuously since 1917, and during the last five years has been the department's London representative conducting economic dealing with American fruit exports. He will return to the United States on May 4, and until the date of his resignation will confer with fruit shippers and exporters in this country in making known to them the latest developments in foreign markets for American fruits.

Mr. Smith was born in western New York in 1888, and in 1912 received a B. S. degree from the Michigan Agricultural College. Prior to his connection with the United States Department of Agriculture he was associated with the British Columbia Department of Agriculture making fruit transportation and storage investigations, and was also engaged in commercial fruit activities.

Appointment of a successor to Mr. Smith, to take up the economic work in Europe at the beginning of the export season next fall, will be announced by the Department of Agriculture at a later date.

TIMBER IS CROP

The greater part of our forest lands has been and still is treated as a mine rather than as a continuously productive resource. If the forest land we now have were all stocked with trees and managed carefully with the object of continuous production, it could yield annually about 27,000,000 cubic feet of wood, or about one-sixth more than our present consumption of all kinds of wood. This would be more than four times the present total growth and seven times the annual increment of saw timber. It would be worse than folly, forest students believe, to make future generations of Americans depend upon foreign countries for such an essential material that can be produced at home.

The New^{way} to Quality



The "new" way to quality fruit, lies in the quantity, kind and quality of raw materials used in ORANGE BELT BRAND — the preparation, handling and conditioning—and in the Lyons service to growers that is nearly as important as the mixture itself.



"Service" is a loose and much misused word, but with us it means real, practical, personal, interested attention to the needs and problems of our customers. It is individual—not just a general policy.

Whenever the size of a crop is unsatisfactory—or the percentage of high quality fruit is too low, there is always a reason. The way to make a poor grove better is to find out what makes it poor.



There is seldom any mystery about it. Citrus trees demand certain food elements from the soil. When these are absent the trees cannot make wood, foliage, or fruit in properly balanced proportion. The trees are always ready to do their part. Give them a "fair break"—supply them with food in assimilable form and adequate quantity and they will respond with sound, heavy, handsome, marketable fruit.

Fertilizer formula don't mean much. Growers are invited to visit our plant and see for themselves just why ORANGE BELT FERTILIZERS are different from others of the same chemical analysis.

LYONS FERTILIZER CO.

Tampa

Florida



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805 Citrus Exch. Bldg.

PLANT
35th St. and 4th Ave

"QUALITY FERTILIZER FOR QUALITY FRUIT"

"Please Say You Saw It In The Citrus Industry"

CITRUS COMMENTS

—BY—

Charles D. Kime, Orlando, Florida

This department is devoted to furthering horticultural interests of Florida. Letters of inquiry, discussion or criticism will be welcomed.

Florida's New Eradication Problem

Fruit flies are always serious pests of the horticultural world. In the temperate zones, we have wormy apples, worms in peaches, corn worms, and melon worms, all costing millions of dollars yearly in spoiled products or expense of control. Any amount of money and effort in the eradication of any one pest is fully justified. The Mediterranean Fruit Fly (*Ceratitis capitata*) is the major fruit pest of all tropical countries. However, this fly is so hardy that it also becomes a serious menace to fruit production in sub-tropic countries. Under sub-tropic conditions, it has been found to propagate freely and to resist the cooler weather of the winter season successfully. The record of the insect as a destroyer of fruit has caused all of the countries where it is still non-existing, to establish the strictest of quarantine measures. Its means of actual entrance into Florida will probably remain unknown. Its wide distribution in the state indicates an infestation of several years duration.

The records of foreign countries show the spread of the Mediterranean fly to all parts of the world. Spain recorded an infestation in 1842, Algeria in 1855, Italy in 1863, South Africa in 1889. Australia was completely infested in two years, beginning in 1897. France reported the fly in 1900 on apricots. A year later New Zealand and Brazil reported infestations. From this time until 1916, fly infestations were reported from Egypt, Asiatic Turkey, Beirut, Jerusalem, Argentine, Africa, Greece, and Bermuda.

The Hawaiian Islands were infested beginning with 1910, and the fly spread rapidly to all the other islands within four years. Hawaii in particular, because of its climate, suffered severely from the effects of the fly's presence.

Practically every fruit in our State is attacked by the fly, though it has and shows decided preferences, depending probably on the toughness

of the rind of the fruit and the ability of the fly maggot to feed on the pulp. In addition to our fruits, many vegetables are also attacked. Lists of host plants will be available shortly.

The fly itself resembles a deer fly or house fly in general shape, though it is usually smaller. The color is distinctive, and once learned not easily forgotten. The abdomen is light brown in color, the legs the same. The back is black and whitish spotted, giving a generally black appearance. The wings are transparent with two noticeable brownish patches on each wing. The eyes are iridescent and vary from purplish to brownish.

Susceptible fruit are usually ripe before attack. The eggs are deposited just under the outside skin through a hole made in the rind by the sharp pointed ovipositor of the female fly. In this cavity, a few eggs, four to six, are laid at a time, though according to Government Bulletin 640, repeated laying of eggs in the same cavity often occurs.

The eggs hatch in two or three days and immediately these maggots burrow into the fruit pulp. The maggots (larvae) are whitish in color and are very small, though easily seen after they become partly grown. When taken from the fruit, the maggots will often draw up somewhat like a measuring worm and then suddenly straighten out and spring several inches. The Maggot is active and easily detected by the rather rapid movement of the sharp black pointed head as it works through the fruit. The rear or blunt end of the maggot has two brownish appearing patches on each side, which under a good hand lense, show up as breathing pores, three to a side. These patches in other maggots than the Mediterranean fly, are usually very black and prominent. The brownish appearance of these patches is the main distinguishing character that is easily observed.

The larvae on maturity leaves the fruit and enters the soil under the tree where it passes through the pupal stage and emerges as an adult

fly. The fly seems to be capable of emerging through a total of three feet of soil, though usually an inch or two is all the maggot will penetrate before changing into the pupal stage.

The total period from fly to fly is usually something under 21 days, though temperature is the deciding factor.

The adult fly is very active during high temperatures and becomes rapidly inactive during temperatures below 50 degrees. None of the stages live long below freezing, which fact keeps the fly in tropical and sub-tropical countries. Cold storage houses usually will not kill the larvae fly as the temperature is rarely sufficiently low.

The adult fly will starve quickly in the absence of fruit juices, honey dew or some sweet secretion from plants or insects. On this fact depends much of the success of eradication measures. The adult can be poisoned by supplying a suitable bait.

Lack of earlier detection of the fly than that of March 30th, 1929 is easily understood when the activities of citrus affected are considered. During our present season, grapefruit has shown the highest percentage of infestation with sour-orange ranking second and Mediterranean varieties of orange third. Along with these last, King oranges, tangerines, seedling and calamndin seem to be attacked with equal severity. So far, there is little evidence that Valencias become infested this early in the season.

We hear many reports that our fruit has been attacked in the same manner as now attacked by the Mediterranean fly during past years. It will be impossible to trace these rumors down, as the evidence has long since been used. The (biology) life history of all insects and diseases are as different and as individual as the lives of two persons would be. There is no likelihood of mixing dissimilar or even similar people. There is just as little likelihood of mixing two insects, flies, or diseases, attacking cit-

May, 1929

rus. Florida fruits have been under the careful observation of entomologists for years. Men from many countries besides the U. S. A. have carefully checked our fruit diseases, and no similar pest has ever been observed. The fruit fly and its method of propagation is different from that of any other pest attacking citrus.

With plenty of food material, many adults may live for six months and possibly longer, during which time they may deposit as high as 800 eggs though average is much lower than this. The adult fly appears to be able to begin laying at any time a suitable host is found during its life time, whether the chance occurs just after hatching or several months later.

In citrus fruits, the maggot burrows from the point of hatching into the fruit and then seems to gradually work around to the lower side of the fruit. At this point, a hole is made through the rind which seems to serve as an air hole, a drainage hole for spoiled juice, and possibly as a breathing hole for the maggots. Later it is used as an exit hole by the maggots in leaving the fruit.

There is no way to tell readily that the fruit is affected, from the time the eggs are laid until rotting and softening of the fruit begins. It is during this stage that affected fruit can be packed and shipped without the shipper knowing of the trouble. Low temperatures will increase the length of time required by immature stages in reaching maturity. According to U. S. Bulletin, 640, the normal egg period of two days may be increased to 25 days or more by temperatures around 48 degrees to 53 degrees. The larvae will survive such temperatures for over two and a half months and even when newly hatched will survive for considerable periods. In one case in the pupa stage a period of two months elapsed when the outdoor temperature ranged between 38 degrees and 72 degrees F. With a mean of 79 degrees, this same

THE CITRUS INDUSTRY

pupa would have hatched in about ten days. At a mean temperature of about 68 degrees, three months can actually pass by before completion of the immature stages of the fly. This is a period sufficiently long to outlast our coldest winter season.

Eradication methods for the Mediterranean Fruit fly in this state will be a combination of a host free period in infested zones and protected zones, together with systematic supplying of a poison bait. Its method of operation is being worked out by the best scientific opinion available.

FIGHTING THE FRUIT FLY

Continued from page 21

ment of Agriculture and the agricultural authorities of other fruit growing states must be satisfied with the progress made here toward eradicating the fly, or that Florida faces the possibility of having the markets of the country closed against its fruits, and its vegetables too for that matter, whether infested or uninfested.

For this Mediterranean fly is one of the feared pests in fruit and vegetable growing sections elsewhere, regardless of what we in Florida may think concerning it. Therefore it may be concluded that the fly is doubly dangerous to Florida. It is dangerous for the amount of actual damage it may be capable of doing to our citrus crops; and dangerous, again, because of the likelihood of its presence here closing to us needed sales outlets for our products.

The better posted men in growing and shipping circles with whom the writer has had contact seem confident that Florida's early start after the fly; and the earnestness of the attack upon it ultimately will result in the fly's eradication here; but few are willing to hazard a guess as to how long it may take to accomplish that eradication.

Ten farmers in Nassau County who treated their corn with carbon bisulphide to prevent weevil damage last

Thirty-three

fall are now selling their corn for seed to those farmers who did not treat their corn, says A. S. Lawton, county agent.

Five hundred pounds of carpet grass seed have been purchased by farmers of Madison County this spring, reports B. E. Lawton, county agent.



AVOCADOS

Insure a substantial income from Home or Orchard Plantings! Over \$40 worth of fruit from one small tree in the back yard of a city lot (name on request).

Strong plants now ready — write for list—

Or send \$10 for our Home Orchard Collection No. 2—six strong plants of our selection best adapted to your section.

Reasoner Brothers'
ROYAL PALM NURSERIES
Box C, Oneco, Fla.

PAINTER'S

Simon Pure Citrus

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**"Time Tried and Crop
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Our Brands are the Acknowledged Standard by which Growers of Florida have judged all Fertilizers for nearly 40 years.

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European Plan, Fireproof 300 Rooms With Baths

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"Please Say You Saw It In The Citrus Industry"

COURT DENIES CARRIERS' REQUEST FOR INJUNCTION

The Statutory Court sitting at Richmond, Va. has denied Carriers' petition for injunction against the publication of reduced refrigeration rates, on citrus fruits and vegetables from Florida until a hearing looking into the cost of haulage of ice had been held, according to a wire just received from the League's Counsel, C. R. Marshall of Washington, D. C. by Mr. J. Curtis Robinson, Executive Vice-President of the Growers and Shippers League of Florida.

As a result of the Court's action the reduction of 14½ percent in refrigeration rates on Florida perishables will become effective May 15th in accordance with the order of the Interstate Commerce Commission issued April 24, 1929.

AUSTRALIAN ORANGE EXPORTS

In a report to the Department of Commerce, Mr. E. C. Squire, American Commercial Attache, Sydney, Australia, states that owing to the increase in the production of oranges in Australia during the past few years, there is available a large surplus over the requirements for domestic consumption, and efforts are being made to develop overseas markets.

Some months ago, an experimental shipment of 200 cases of Australian oranges was made by the New South Wales Department of Agriculture to test the efficiency of various dipping processes. The object in view to discover means to overcome the development of blue mold and wastage in transit. Owing to the shipping hold-up in September, the oranges were nine weeks on the water instead of six. The New South Wales Minister for Agriculture has released a report on the results of the shipment, high points of which are the fact that the least decay was found in oranges that had been dipped in an 8 per cent solution of borax; also, that the next least decay was found in oranges dipped in a 3 per cent solution of bicarbonate of soda. As the British health authorities prohibit the use of borax, this process cannot be used on Australian orange exports. Mr. Squire reports that the use of bicarbonate of soda is to be further investigated.

There are more spring pigs in Leon County than in the past five years, according to G. C. Hodge, county agent.

THE CITRUS INDUSTRY REFORESTATION MEANS

Reforestation means the renewal and perpetuation of tree growth. In the main, its object is to rear and harvest on the same land, in an unending round, successive timber crops. Unlike many natural resources, forests can be used and regrown forever. Continuous production of tree crops on land best suited for that purpose is the aim of forestry.

Citrus growers of Highlands County have placed orders for nearly 20,000 pounds of Crotalaria seed, which will be imported from Porto Rico at a great saving. Crotalaria has demonstrated its value as a summer cover crop in the Ridge section.

CLASSIFIED

Advertisements

The rate for advertisements of this nature is only five cents per word for each insertion. You may count the number of words you have, multiply it by five, and you will have the cost of the advertisement for one insertion. Multiply this by the total number of insertions desired and you will have the total cost. This rate is so low that we cannot charge classified accounts, and would, therefore, appreciate a remittance with order. No advertisement accepted for less than 50 cents.

REAL ESTATE

FOR SALE—By owner, eighty acres, two-year-old best looking grove at reasonable price. Howey-in-the-Hills. For further information write "A. Z." P. O. Box 1261, Orlando, Florida.

WILL EXCHANGE West Texas cattle ranch for unimproved or improved land in Florida. What have you? Give price and full particulars. T. E. Bartlett, 3410 McKinley Ave., El Paso, Texas.

FOR SALE—Pineapple land in winterless Florida. \$15 an acre. Almont Ake, Venus, Fla.

WANT TO SELL HALF INTEREST IN FIFTEEN ACRE SATSUMA BEARING GROVE ON HIGHWAY NEAR PANAMA CITY. ROBT. LAMBERT, OWNER. FOUNTAIN, FLA.

SATSUMA BUDWOOD from Bearing Trees. Hills Fruit Farm, Panama City, Fla.

WANT TO hear from owner having farm for sale; give particulars and lowest price. John J. Black, Box 93, Chippewa Falls, Wisconsin.

MISCELLANEOUS

RUNNER peanuts—Spanish peanuts Early speckled - Osceola - White Chinese and Bunch Velvet Beans. All varieties peas and Soybeans. Large or small lots. H. M. Franklin, Tennille, Georgia.

HIGH BLOOD PRESSURE easily, inexpensively overcome, without drugs. Send address. Dr. J. B. Stokes, Mohawk, Fla.

WHITE WYANDOTT Cockerels, regal strain—the best in the country, direct from

WANTED COMPLETE LINE OF CITRUS GROWERS' SUPPLIES

A well known reputable firm of national scope, marketing certain materials required by citrus growers, is extending its line of merchandise to cover complete requirements of its customers.

If you have something excellent to merchandise—fertilizer, orchard heaters, pest control material or equipment, or any similar product for wide distribution—I can tell you whom you should see.

Address: J. T. Pierson, 503 South Union Drive, Los Angeles, Calif.

Martin pens. Utility and show birds \$5.00 each; also eggs for hatching \$5.00 per 15. W. A. King, Gen. Del., St. Petersburg, Fla.

BEGGARWEED SEED. Place your order for Beggarweed seed now and be assured of delivery. Write for special prices. Wm. G. Ranney, Box 297, Monticello, Fla.

PUREBRED PULLETS FOR SALE—White Leghorns and Anconas ready to ship. Barred Rocks and R. I. Reds shortly. Several hundred yearling White Leghorn hens now laying 70%. Write or wire for prices. C. A. Norman, Dr. 1440, Knoxville, Tenn.

LAREDO SOY BEANS, considered free from nematode, excellent for hay and soil improvement. Write the Baldwin County Seed Growers Association, Loxley, Alabama, for prices.

FARMER AGENTS: Make \$25.00 weekly selling Comet Sprayers. Profitable winter employment. You take orders. We deliver and collect. Commissions weekly. Established 35 years. Particulars free. Rusler Co., Box C-18, Johnstown, Ohio.

FOR SALE—All varieties bananas and citrus trees. D. A. Nigels, Palm Harbor, Fla.

FOR SALE—Dairy and stable manure, car lots. Link & Hagley, Box 464, Tampa, Fla.

AVOCADOS - SEED — Grafted. Reliable bearers only. John B. Beach, West Palm Beach, Florida.

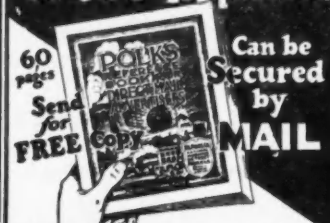
BABY CHICKS: Send no money, shipped C. O. D., pay mail man when delivered. Leghorns \$14.00 per 100; reds, orpingtons, minorcas \$16.00; mixed \$13.00; live delivery, postpaid. Florida Baby Chickery, Lakeland, Florida.

ROUGH LEMON Seedlings in any quantity, special summer sale, very attractive prices. A. E. Nichols, Box 262W, Tampa, Fla.

CITRUS EXPERT and landscape gardener desires superintendency of larger grove or estate. Address, P. O. Box 2072, Sarasota, Florida.

WANTED—To hear from owner of land for sale. O. Hawley, Baldwin, Wis.

Orders - Inquiries



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Gives counts and prices on over 8,000 different lines of business. No matter what your business, in this book you will find the number of your prospective customers listed. Valuable information is also given as to how you can use the mail to secure orders and inquiries for your products or services.

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